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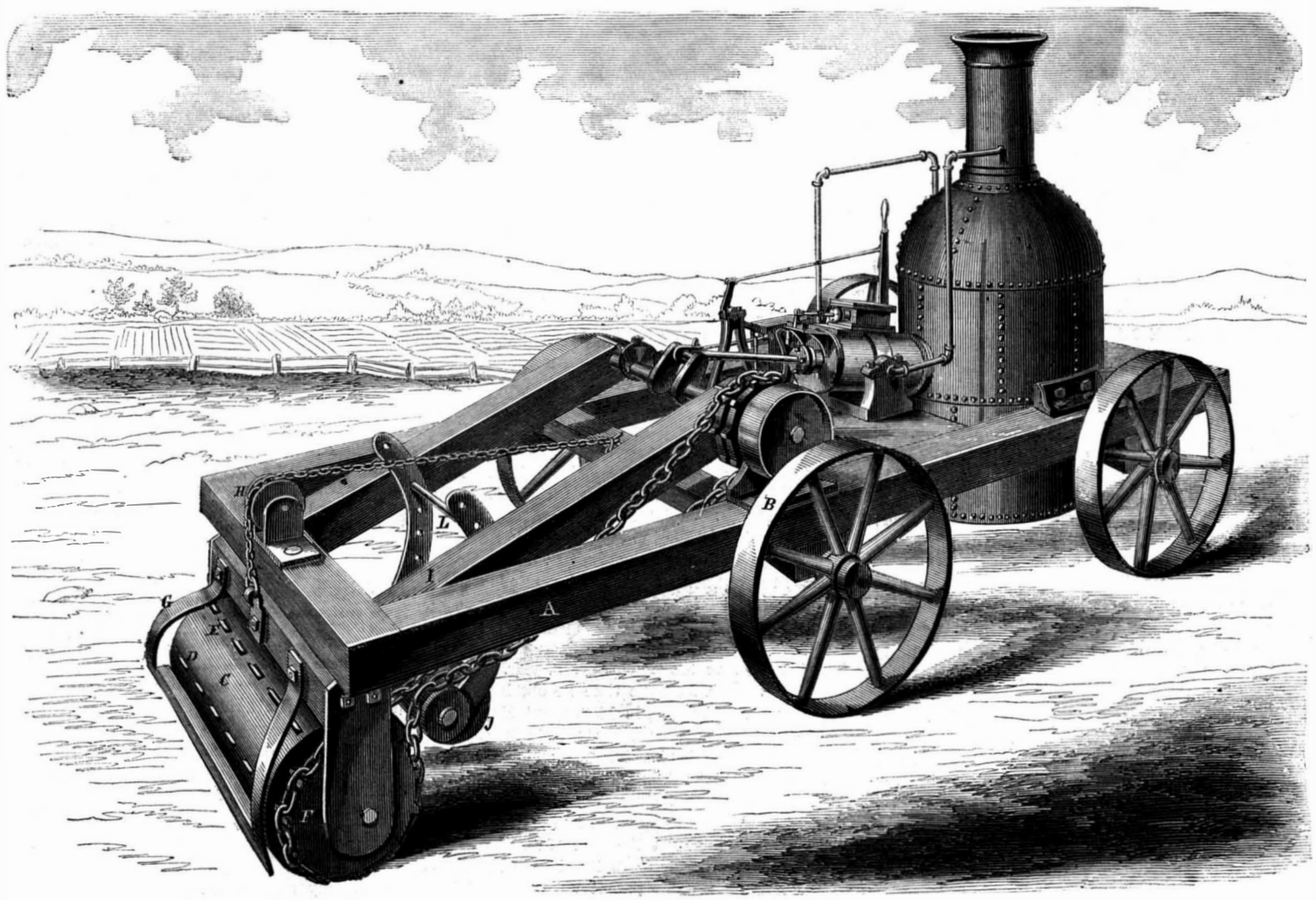
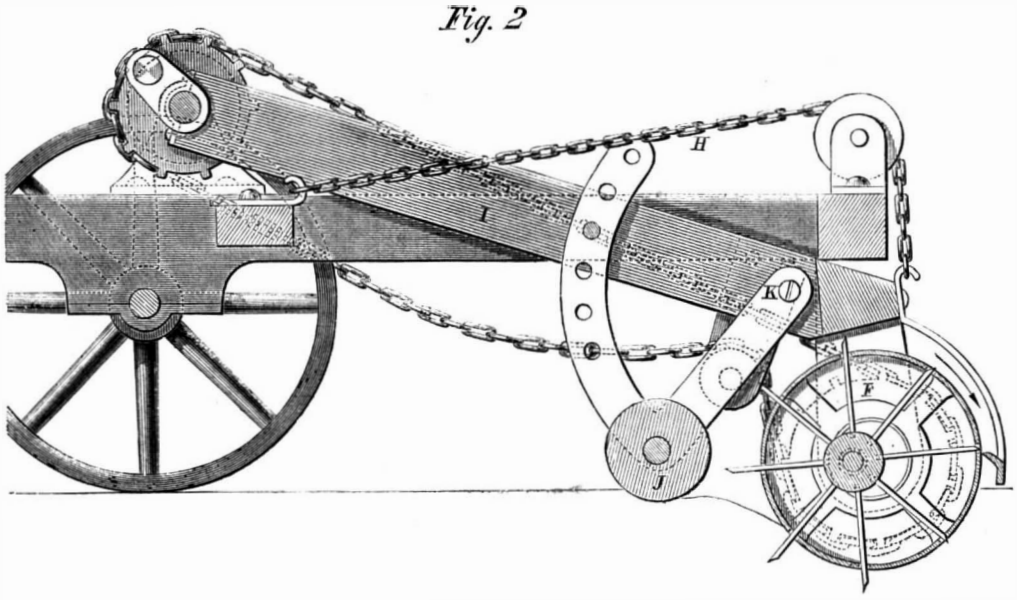


HAWLEY'S STEAM PLOW OR SPADING MACHINE.

From the earliest days of the cultivation of the soil down to the present time men have sought, and are still seeking, for the most economical, simple, and efficient instrument to accomplish the object. Since steam has become the indispensable ally of progress in every shape, it is but natural and proper that attention should continually be given to it, and that the genius of our inventors should seek to adapt it to this new sphere. Very many steam plows have been invented in England and in this country, all of them, however, on principles essentially different from the one which is herewith illustrated.

Fig. 2



In Fig. 1 we have given a perspective view, and in Fig. 2 a section—which will render the whole clear to the reader. The inventor and artist have so lightened the labor of the editor that but little remains to be done by us toward making the machine intelligible.

The large frame, A, which carries the whole machinery—engine, boiler and its appendages—is supported by the wheels, B, over which it projects for about half its entire length. At the extreme end of this frame there is placed an iron cylinder, C, with sets of slots, D. along its length. Through these slots the spades, E, work, being controlled in their action by the arrangement of the drum and its relation to the axle the spades are fastened to. This may be seen clearly in Fig. 2, where the spades are shown projecting on one side, and flush with the surface of the cylinder on the other. The working side of the cylinder is in, or toward the boiler, and as the spades enter the soil the plow or the whole machine is propelled backward so as to act on new and unbroken ground.

The drum or cylinder has a rag wheel, F, fastened on one end, over which a chain passes to a similar wheel on the main shaft of the steam engine which furnishes the motive power. Of course when the engine is started the spades begin to act in obedience to the parts with which they are connected. At the rear side of the cylinder or drum there is a guard or scraper, G. This guard is attached to the long timber the cylinder works in, the hight of which is regulated by the chain, H, and it works so close to

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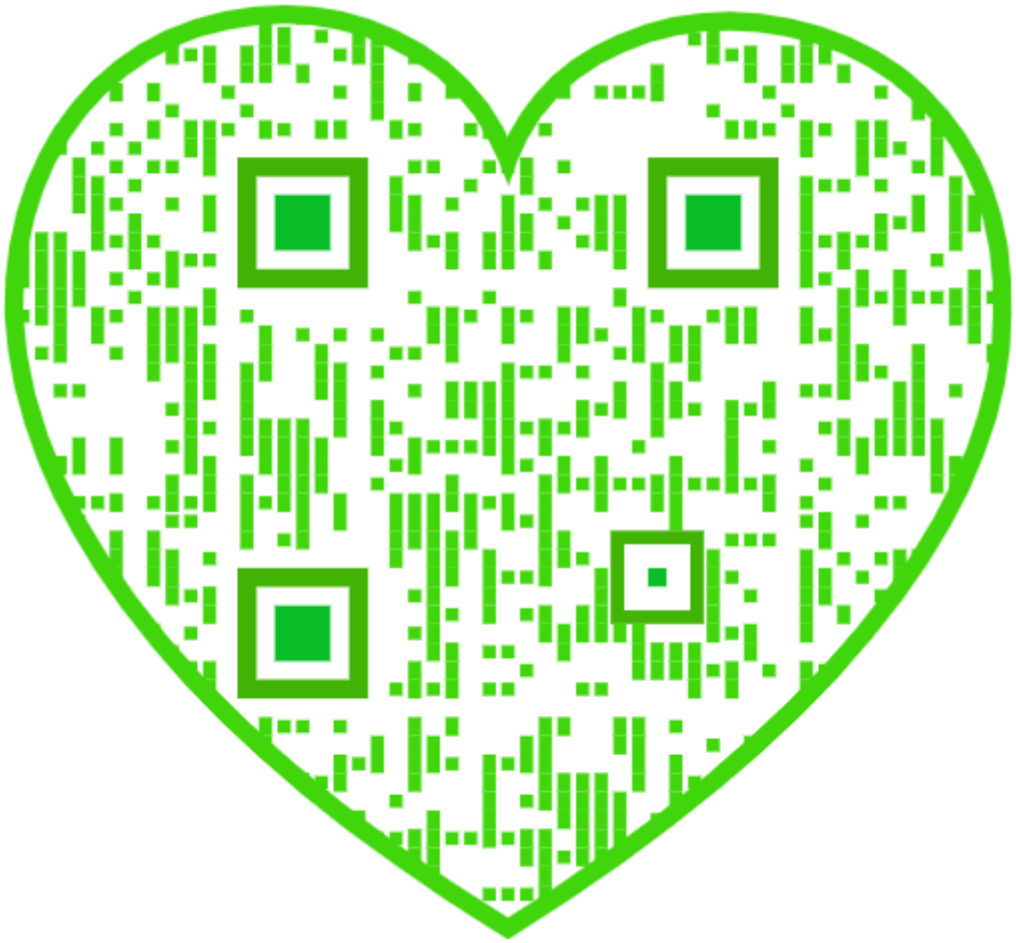

the cylinder as to almost touch it, its purpose is to keep the exterior clean, or scrape off the loose soil which might enter through the slots the spades work in, and clog their operation.

It will be seen that the spading cylinder is attached to the timber supports, I, which are in turn movable on the engine shaft. The roller, J, Fig. 2, is set in one arm of a quadrant, said quadrant having holes and being capable of oscillation on its center, K. This roller is quite wide and is to limit the depth at which the spades work, the point being fixed by inserting the shaft, L, through any hole desired in the quadrant and timbers near it.

This plow is as well adapted to work on rolling ground as upon level, for the spading cylinder being attached to the long arms connected with the crank shaft of the engine, moves up and down, but always works at the same depth relatively, and without communicating any jar to the engine itself. The machine does not run over the ground it has just turned up, but as the spading cylinder is in the rear (the spades working toward the boiler) the furrows are left in the condition most favorable for the reception of seed.

This steam spader is the invention of E. H. Hawley, of Broadalbin, Fulton county, N. Y. A patent is now pending on it through the Scientific American Patent Agency. Further information can be had by addressing the inventor, care of H. G. Hawley, as above.

ANNUAL REPORT OF THE COMMISSIONER OF PATENTS.

"The next question which I propose to discuss, is the comparison of our own system of patents with those of the great industrial nations. Our patent system is founded mainly upon the statute of 1836, framed under the advice of the most experienced lawyers of the period, but carried through by the energy and wisdom of a distinguished senator of Maine, Mr. Ruggles, who deserves the grateful acknowledgments of the country for securing the passage of an act which has proved one of the most beneficial in our legislative history. The characteristic feature of our patent policy is the system of examination as to the novelty of inventions conducted by the Commissioner of Patents through an examining corps, selected for their special accomplishment in the arts which it is their duty to examine. No system of examination like our own exists in Europe, except to a very limited extent. I have before me a synopsis of the patent laws of nearly all the countries in Europe. In Great Britain, France, Austria, Belgium, Spain, the Roman States, Sardinia, and the Sicilies and Saxony, there is no examination as to novelty. In Prussia, Russia, the Netherlands, Hanover, and Bavaria, there is an examination by learned societies and commercial boards, instituted mainly for other purposes, but the whole number of patents granted in the last-named countries in 1858 was only 173; while in the first-named countries, in the same year, there were issued 10,297 patents. So that, considering the number of patents issued, our own peculiar system stands comparatively alone among those of all civilized nations.

"The system of granting patents in Great Britain without previous examination as to novelty has led to the granting of a great number of patents for the same thing—an evil which became so great as to lead to the publication of all the specifications, which only partially remedies the evil. Mr. Woodcroft says, 'that having found so great an abuse to exist, as to granting patents for the same thing over and over again, he was led to prepare a list of those which related to the origin and progress of steam navigation.' 'I found,' he says, 'that no step in the art of steam navigation had been made which was not the subject of a patent. Among 400 patents, I found that a very few heads would comprise the whole of the inventions; for instance, of vertical paddle-wheels there have been a score of patents which are identically the same in mechanical action; for drawing water at the bow of a vessel and pumping it out at the stern, there have been another score or two; then for making the float-boards of paddle-wheels move in various directions on their axis, there have been also as many patents; and for propellers in imitation of ducks' feet, there has been a large number of patents.' A striking instance of the evil resulting from this system is taken from Mr. Woodcroft's evidence. He says: 'I have known of a patent within the last year upon which a gentleman had spent about £11,000. He came and consulted me, and wanted me to go and look at a boat he had been constructing. I said it is of no use; I have seen the drawing, and the invention is as old as the hills, and you will never drive the boat six miles an hour; in addition to that, the invention is not yours—it has been patented over and over again.' Mr. Hodge, an English patent agent, who had personally witnessed the practical working of our system of examination, and heartily approved of it, speaking of the English practice, says: 'Many inventors have been ruined in consequence of taking out patents under our (the English) system; whatever amount the patent may have cost the inventor, it may be assailed the very next hour. I can refer to a case in which a patent was tried before a special jury; upon their decision being given, the patentee went out of court saying he was a ruined man. And if he had not had a few friends to come and support him he would have been ruined.. If the Government had appointed a board of examiners to examine his patent, and to show him that it was not quite original, and that there was a little infringement upon another patent, he would not have had occasion to go to this great cost.'

"Sir David Brewster declared that the protection of patents ought only to be extended to new ideas, and that he would ascertain the novelty of such ideas by means of a board of commissioners composed of scientific persons. It is due to the pervading knowledge that a patent in Great Britain is not even *prima facie* evidence of the originality of an invention, and that it is of little value, except to give the patentee a status in the courts until it has passed a judicial ordeal, that such severe litigation exists in that country in relation to titles to inventions. The costs of such litigation are sometimes frightful. Two startling instances are related by Sir Hugh Cairnes in the speech in the House of Commons, before referred to. A patent had been taken out by an eminent manufacturer in Sheffield for an invention which effected a revolution in the manufacture of steel, by the introduction of a chemical substance, and enabling steel to be produced at a reduction of thirty or forty per cent. on the previous cost. Mr. Heath, the alleged inventor, from the time he obtained the patent, in 1842, till he died, in 1853, spent his life in litigation. The suit was formally carried to the House of Lords, and he obtained a statement which showed that the costs of the defendant were estimated at £7,000, and those of Mr. Heath at £8,000, showing that the two sides had expended in litigation connected with a single patent the sum of £15,000. It appears by the statement of a writer in the London *Quarterly Review* that this patent was extended in 1853 for the benefit of Mrs. Heath. In August, 1853, Mrs. Heath brought an action against an infringer, and then, for the first time, credible evidence was given that the invention was not new at the date of the original patent. A patent was taken out in 1850 or 1852, by a Scotch gentleman named Menzies, for capsules and tops of bottles. The invention being a very valuable one, litigation in connection with it was carried on both in chancery and in the courts of common law. After, according to M. Montagu Smith, a verdict in favor of the patentee, the case was taken to the Queen's Bench, where the patent was defeated on the ground that an old patent had been discovered in the office by which the invention had been anticipated. Finally, the case was carried by appeal to the House of Lords, where, in 1862, it was still pending. Sir Hugh Cairnes stated that the solicitor to the plaintiff informed him that the costs of his client amounted to £14,487, and he estimated those of the defendant at £10,370. So that the total costs of legal proceedings, in connection with the invention, amounted to not less than £24,857. The legal expenses connected with these two patents, which might have been saved to the unhappy litigants by a system of preliminary examination, was £39,857, or about $199,285, about $10,000 more than the total expenses of this office for the last year, viz: $189,414 14, which, during this period, has made examination of 6,014 applications. Of these applications, 1,844 were refused, principally upon the ground of a want of novelty, while 4,170 patents have been granted. It is not pretended that errors from unsoundness of judgment or insufficiency of investigation may not have occurred in these decisions. But I feel confident that, as the general result of our system, its benefits have accrued no less to the unsuccessful than to the successful applicants; that while the latter have secured patents to which an intrinsic value has been imparted by the scrutiny to which the inventions have been subjected, and by the sanction of the office are comparatively protected from infringement and litigation, the former have been saved from waste of time and labor upon well-known machines, and from the cost and misery of defending in courts of law rights to which they could maintain no title.

"The readiness with which persons acquainted with any particular branch of invention, and provided with facilities for investigation, can determine questions of novelty, is admitted by Mr. Woodcroft, of the British Patent Office, although opposed to the system of examination. Being asked by the select committee whether, supposing he were professionally employed to determine for parties upon the novelty of their inventions, he thought he could undertake generally to determine that point with a moderate degree of time and expense, he replies, 'If I had the whole of the specifications before me I could do it in a moderate degree of time, and at a moderate expense.' The facilities for determining the novelty of inventions demanded by Mr. Woodcroft are most amply provided in this office. It possesses a technological library, unequalled by any in this country. It has opened relations with nearly all the governments in the world for obtaining information, up to each current month, of the progress of inventions abroad. Its portfolios of drawings, so numerous as to crowd two halls, each nearly one hundred feet in length, and yet so systematically arranged that the hand can at once be laid upon any drawing sought for, and its museum of models, unrivalled by any similar collection in the world, exhibit as in an open book all that has been done in American inventions. It is the fault of the administration, and not of the system, if the plan and facilities for examination are not as perfect as human ingenuity has devised.

"Another favorable point of comparison of our own with the English policy is the cheapness with which patents are obtained in this country, the cost being limited to the amount necessary to create a fund for reimbursing the expenses of the Patent Office, while in Great Britain the cost of obtaining a patent is £175—over twenty-two times the cost in this country. From the fund accumulated by these fees in five years there was deducted for stamp duties the enormous tax of £67,060.

"The objections to the frivolity and multiplicity of patents are so often thoughtlessly made, even in this country, as to be worthy of refutation. Those who have carefully studied the progress of civilization must have observed that the uplifting of society has not been effected by paroxysmal convulsions, such as were supposed by geologists of former times to have upheaved the ancient continents at a single shock, but by causes which have operated as gradually and imperceptibly as those which modern science has shown to have actually raised, within historic periods, vast countries, with the whole burden of their cities and unconscious people. The progress in mechanical improvements and in science has been so gradual that it is difficult to trace it except by the great general results. The fields of invention and practical knowledge have been extended by accretions as insensible as those which have formed the delta of the Mississippi. Every new fact in science, every new conception of ingenuity, no matter how trivial, has added something to their area. The noblest inventions which now astonish the world—the steam-engine, the cotton mill, the railroad—have been as truly built up block by block, layer by layer as the pyramids. More than eight hundred distinct inventions were required to perfect the cotton-spinner. To refer to more recent branches of mechanical industry, we find some of the best harvesting machines protected by no less than twenty patents, each invention consisting of but a trivial improvement, yet the whole being necessary to the perfection of the machine. The art of sewing by machinery, which originated no later than 1842, has attained its almost miraculous development in this country through more than six hundred inventions for which patents have been issued. It is by no means asserted that all these inventions have been found practically useful;

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out perhaps no other art can so well illustrate how, in mechanical contrivances, idea begets idea, and the invention of yesterday gives birth to the invention of to-morrow.

"The apparent insignificance of an invention is no measure of its value. Inventions in the meanest of household arts, such as improvements in washing and wringing machines, have not only contributed most materially to domestic comfort, but have given rise to single manufacturing establishments employing over half a million of dollars of capital. Improvements in articles so trivial as hooks and eyes, and pins for infants' clothing, have been the foundation of patents which have produced tens of thousands of dollars.

"The application of a pencil mark in submarine blasting, and the explosion of military mines by the electric current, enables the operator to dispense with cumbersome and costly batteries and machinery formerly indispensable. A spring for holding the deflector and chimney upon a coal-oil lamp, consisting simply of a bent strip of brass, has gone into universal use, and through a tariff of a few mills upon each lamp to which the invention is applied, has yielded several hundred thousand dollars to the inventor. The more minutely the arts are studied, the more will the conviction be forced upon the mind that, as the distinction between great and small appears to be unrecognized by Providence, the distinction between important and trivial, and useful and worthless, should never be applied to any original work of human ingenuity."

These same observations apply to the whole range of inventions. Indeed without the potent influence of patented inventions civilization would make slow progress.

NEW YORK MARKETS.

[WEEK ENDING MAY 28, 1864.]

Ashes—Pot, $9 75; pearl, $12 75 to $13 per 100 lb.
Beeswax—59c. to 60c. per lb.
Bread—Pilot, navy, crackers, 4¾c. to 8c. per lb.
Candles—Adamantine, stearine and sperm, 22c. to 45c. per lb.
Cement—Rosendale, $1 50 per barrel.
Coffee—Java, 49c. to 50c. per lb.; Rio, 43c.; St. Domingo, 37c. to 38c
Copper—American ingot, 45c. per lb.; bolts, 56c.; Sheathing, 55c.
Cordage—Manilla, 21¾c. per lb.; Russia—tarred, 21c.; American, 17c.
Cotton.—Ordinary, 87c. per lb.; Middling, 97c.; Fair, 101c.
Domestic Goods.—Sheetings, brown standard, 42c. per yard; Sheetings, brown, seconds, 40c. to 41c.; Shirtings, brown, 7-8, standard, 35c: Sheetings and Shirtings, bleached—Wamsutta and New York Mills 41½c. to 42c.; Lonsdale, White Rock, &c., 35½c. to 36½c.; other makers 18½c. to 34½c.; Drills, brown, Amoskeag, 40c. to 41c.; Drills, other, 31½c. to 37½c.; Ticks, York 60c. to 65c.; Ticks, Amoskeag 42½c. to 65c.; Ticks, other 23½c. to 47½c.; Prints, Merrimack 23c.; Prints, Sprague's 23½c. to 24c.; Prints, Dunnell's 22c. to 23c.; Prints, other 20c. to 22c.; Ginghams, Clinton 23c.; Ginghams, other 21c. to 27c.; Cottonades, York 55c. to 70c.; Cottonades, York Mills 45c. to 70c.; Cottonades, other 55c. to 70c.; Cotton Jeans, Laconia, &c., brown and bleached 39c. to 40c.; Cotton Jeans, other 29c. to 37½c.; Cotton checks, 20c. to 37½c.; Cambrics, 21c. to 26c.; Cotton Flannels, brown and bleached 39c. to 46c.; Cloth, all wool $1 85 to $4; Cassimeres, $1 50 to $3 50; Satinets, 80c. to $1 10; Flannels, 47½c. to 70c; Broad Cloth, $4 to $8.
Dyewoods, Duty Free.—Fustic, $47 to $50 per tun; Logwood, $28 to $62½; Lima Wood, $1 40 to $1 45; Sapan, 90c.
Feathers—70c. to 72c. per lb.
Furs.—Otter, $4 to $8 skins; Fox, grey silver, $5 to $10; Bear, $8 to $30; Lynx, $3 to $5; Marten, $2½ to $20; Muskrat, 12c. to 30c.;
Flax—18c. to 22c. per lb.
Flour and Meal—$6 60 to $10 75 per barrel; Rye Meal, $5 75 to $6 75.; Corn Meal, $6 60 to $7.
Grain.—Wheat, $1 57 to $1 90 per bushel; Rye, $1 48 $1 50; Barley, $1 35 to $1 48; Oats, 83c. to 86c.; Corn, $1 40 to $1 50; Peas, $1 20 to $1 24; Beans, $2 67 to $2 90.
Hay—$1 50 per 100 lbs.
Hemp.—American (dressed), $280 to $310 per tun; Russian, $425; Jute, $290 to $300.
Hides.—City Slaughter, 13c. to 13½c.; other varieties range from 15c. to 36c.
Honey.—$1 30 to $1 37½ per gallon.
Hops.—20c. to 32c. per lb.
India Rubber.—40c. to 93c. per lb.
Indigo.—Bengal, $2 to $2 60 per lb.; others, $1 20 to $2 30.
Iron.—Scotch pig, $50 to $60 per tun; American, $58 to $60; Bar—Swedes $171; English, $140 to $145; Sheet—Russia, 21c.; English, 25c. to 30c.
Lead.—American, $12 62½ to $12 75 per 100 lbs.; English $10 50; Pipe, 15½c.
Leather.—Oak-tanned, 49c. to 52c. per lb.; Hemlock, 27c. to 51c.
Lime.—$1 35 to $1 80 per barrel.
Lumber.—Spruce, $21 to $23 per 1,000 feet; White Oak, $35 to $40; White Oak Staves, $70 to $170; Mahogany crotches, 80c. to $1 10 per foot; Rosewood, 4c. to 12c. per lb.
Molasses.—67½c. to $1 per gallon.
Nails.—Cut, $7 per 100 lbs.; Wrought, 32c. to 33c. per lb.
Oils.—Linseed, $1 63 to $2 per gallon; Sperm, $1 70 to $1 85; Petroleum, 35c. to 69c.
Provisions.—Beef, $6 to $9 50 per barrel; Pork, $27 25 to $29; Butter, 28c. to 42c. per lb.; Cheese, 12c. to 17½c.
Rice.—$8 50 to $10 per 100 lbs.
Salt.—Turk's Island, 57½c. per bushel; Liverpool fine, $4 50 per sack.
Saltpeter.—19½c. to 20c. per lb.
Spelter.—12¾c. to 13c. per lb.
Steel.—English, 14½c. to 32c. per lb.; German, 14c. to 16c.; American cast, 21c. to 23c.; American spring, 14c. to 16c.
Sugar.—Brown, 11c. to 15½c. per lb.; White, 14c. to 19c.
Tea.—65c. to $1 65 per lb.
Tallow.—American, 13¾c. to 14c. per lb.
Tin.—Banca, 51c. to 60c. per lb.; English, 52c. to 53c.; plates, $14 25 to $18 50 per box.
Tobacco.—Leaf, 12½c. to 30c. per lb.; Cuba fillers, 60c. to 85c.; United States wrappers, 25c. to 65c.; Manufactured, 55c. to 90c.
Wool.—American Saxony fleece, 78c. to 82c. per lb.; Merino, 75c. to 77c.; California, 20c. to 48c.; Foreign, 16c. to 60c.
Zinc.—17½c. to 18c. per lb.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Mold for Casting Screw-heads, etc.—This invention relates to molds of cast-iron or other metal for casting several articles at a time. It consists, firstly, in the combination with several molds, arranged in a circle, of a single central runner which tapers in an upward direction to the mouth, and branch runners radiating from the said main runner, to supply the several molds at the same time therefrom, whereby the metal is enabled to run in a uniform fluid state to the several molds and the necessary facility for parting the several molds is afforded. It consists secondly in certain novel means whereby the parting of the several molds for the removal of the castings is effected more easily and expeditiously. N. S. Williams of East Hampton, Conn., is the inventor of this improvement.

Journal Box.—This invention consists in a novel arrangement of anti-friction rollers, the same being of two different sizes or diameters, placed alternately, large and small, around the journals of the axle or shaft between the journals and the bearings or boxes, and arranged in such a manner as to work perfectly free or without any positive connection one with another, whereby a vast amount of friction is avoided in the working or rotating of the axle or shaft, and at the same time a very durable anti-friction journal box obtained. Anti-friction rollers have been previously employed and arranged in various ways in frames so as to form a roller cylinder between the journals and the bearings. These, however, have proved frail, the rollers soon becoming detached from the frame or rings in which they were fitted. In this arrangement the small rollers are employed to keep the large ones in proper position and at a proper distance apart, the latter serving as the anti-friction medium. John O. Scott, of 536 Broadway, New York, is the inventor of this improvement.

Boring and Drilling Machine.—This invention relates to a new and useful attachment for boring and drilling machines, such as are provided with a sliding frame for holding the auger or drill arbor. The invention consists in the employment or use of an adjustable rack bar, arranged in connection with the gearing by which motion is imparted to the drill arbor, in such a manner that the sliding frame may, when it has reached its lowest point of descent, or at any time when it is desired to raise the auger or drill, be readily raised by throwing the rack bar in contact with one of the wheels of the auger or drill-driving gear, and while said gear is being turned in the proper direction for operating the auger or drill; the rack bar being thrown out of gear when it is desired to lower the sliding frame by simply turning the driving shaft a short distance in a backward or reverse direction. The above invention is to Samuel U. King, of Windsor, Vt., and it has been assigned in full to the Lamson & Goodenow Manufacturing Company, of Shelburne Falls, Mass.

Improvement in Military Knapsacks.—Those who have particularly observed the personal condition of a soldier, when on the march, with all his equipments and necessaries attached to his person, must have noticed the peculiar discomfort which the loaded knapsack always occasions. At every halt the man is obliged to stoop forward, and, by a jerk of the body, hitch up the uncomfortable load; when time permits he unfastens the galling arm straps, or wholly casts off the burden. Any improvement which really tends to reduce the fatigue of weary marches, and lighten the labors of our brave defenders, will be hailed with especial favor. To this class belongs the present invention. One feature of the improvement consists in so arranging the knapsack and the musket that the two weights counterbalance each other, and are saddled fairly upon the shoulders. The soldier no longer needs to march with the musket carried wholly in his hands and arms; he is no longer troubled with the swaying of the barrel; the knapsack no longer slips; and there are no arm-pit straps to inflame those tender parts. By this advantageous method of distributing the burdens the soldier feels as if half his load had been removed; and he experiences a remarkable freedom of limb, and relief from fatigue. This invention is very highly spoken of by military officers. Oliver Evans Woods, of 1,003 Race street, Philadelphia, Pa., is the inventor. Mr. Woods, by the way, is a grandson of the immortal Oliver Evans, famed as the inventor of the steam locomotive.

Railroad Chair.—This invention is an improvement on that class of railroad chairs on which a patent was allowed to Mr. St. John, May 19th, 1863, and which consists in the employment or use of a sustaining bar that extends across two sleepers or cross-ties, and fits into the necks of adjoining rails, and is held in place by a bed piece supported by said two cross-ties in such a manner that said sustaining bar receives the weight and thrust of passing trains conjointly with the top of the rails, and being supported by the underlying cross-ties at the weak points, serves not only as a sustaining but as a reacting support to keep the rails in line and in surface. The nature of this present improvement consists in the combination with the bed piece and sustaining bar of an independent clamp, which holds the bed piece and sustaining bar together with the ends of the adjoining rails, in such a manner that each of the three parts, viz: the sustaining bar, the bed piece, and the clamp, can be readily produced by rolling, and that a chair is produced which is cheap, durable, and readily applied, and which keeps the track level and in line, and is not liable to get out of order. E. St. John, of Elmira, N. Y., is the inventor of this improvement.

The claims of the following inventions appeared in the list of last week (May 17):—

Machine for Splitting Wood.—In this device the wood is split by the fall of a weighted block, something like that used in a pile-machine. The splitting knives are stationary. The improvement relates to the construction and arrangement of the parts pertaining to the lifting and discharge of the weight. The machine is driven by steam or horse-power, is simple in construction, rapid in operation, and apparently very effective for the purpose intended. John A. Knight, of St. Louis, Mo., is the inventor.

Stump-pulling Machine.—This machine somewhat resembles, in external appearance, the wheels, axle and tongue of a heavy wagon, when detached therefrom. But in the present instance the tongue projects back beyond the axle and forms a short lifting lever, of which the axle is the fulcrum and the tongue the long lever. Pulleys are placed in the ends of the tongue and also upon a separate pulley bar, which extends from wheel to wheel, and is placed under them. By means of a rope a compound pulley is formed between the pulley bar and the tongue, by which the latter is forced down with immense power, and the short lever, with its attached stump, is raised. We regard this as a very simple and excellent improvement. B. F. Tuttle, of Chelsea, Washtenaw county, Mich., is the inventor of this machine.

THE naval editor of the Boston *Advertiser* says:—"The machinery of the iron-clad *Dunderberg* necessary to be put on board the vessel before she is launched, is nearly completed, and will be put in next week."

[There must be some mistake about this, for the last time we saw the engines the greater part of them were lying in the street untouched. EDS.

ONE cubic foot of hydrogen will heat 2.22 lbs. of water from 32° F. to 212° F.; one cubic foot of carbonic oxide will heat 2.16 lbs. of water from 32° F. to 212° F.; one cubic foot of marsh gas will heat 6.17 lbs. of water from 32° F. to 212° F.; one cubic foot of oleflant gas will heat 10.74 lbs. of water from 32° F. to 212° F.

PURE wrought iron melts at about 2,350° Fahrenheit.

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USE AND ABUSE OF THE PIANOFORTE.

It is really surprising to note the ignorance that prevails in regard to this universally popular musical instrument. The general class of people who possess them seem to know rather less about their manufacture and the proper method of using them than they do about the watches they wear. With a view of enlightening the most benighted of the owners of pianos on the subject of their proper use and preservation, we have procured the following information on the subject from one whom we deem competent authority:—

The great desideratum aimed at, by the best manufacturers of pianos, is to make them stand in tune well, for unless they succeed in this respect the quality of tone or beauty of finish they may impart to their pianos is comparatively of little value. To attain this desirable object, therefore, is the principal aim of our best makers; but few, however, succeed, and we will briefly state the reason. The steel pins that hold the wires of a piano are driven into a solid block of wood, and in order that this wood may retain a firm hold of the pin, and yet admit of its being turned by the hammer of the tuner, not only is great care and skill necessary in regard to the fitting of these pins, but it is absolutely requisite that the wood forming the "pin block" should be of the very best seasoned material. Now this "seasoned" wood is best when prepared by out-door seasoning instead of by artificial means, but unfortunately this former method requires considerable capital to admit of so much dead stock, as it were, lying by. This large capital but few manufacturers have, and the result is, they have to use heat-dried wood, and the majority place wood thus seasoned in their pianos that will not stand the action of the hot-air furnaces in such general use in private houses. The consequence in such cases can be readily foreseen, the result being that a year or two's use so shrinks up the wood of the pin-blocks, of those pianos in which this half-seasoned stuff is used, that the pins move in the block from every hard blow on the wires, and hence the piano will not stand in tune.

So much for the injurious effects of this artificial heat on a piano, as far as its standing in tune is concerned. In reference to its effect on the "action" of a piano, viz., the keys and machinery for striking the wires, the result is, that the heat warps the keys, loosens the hold of the great number of screws used in an action, in the wood, and thereby causes the keys to stick, or rattle, as the case may be. Now how to obviate these evils is the question, and the answer is, in the first place, only to purchase those pianos that are made of thoroughly-seasoned wood, and of the best quality of materials generally, for such only are the cheapest pianos, no matter what their first cost may be; and, secondly, to keep your piano as much from the influence of the hot air of your house furnace as possible, for it injures the best made pianos, and almost renders those of inferior quality useless.

We frequently hear the remark that "our piano stands in tune for a year." Now the truth is, there is not one piano out of a thousand that, with any ordinary use, will stand bearably in tune two months, and not one in five thousand that will remain perfectly in tune for three weeks. True, pianos will stand sufficiently in tune to suit an unskilled musical ear for half a year at times, but no cultivated ear can tolerate the discord that ensues after a month or two's use. Any reflecting individual can readily perceive why this is, when it is considered what materials constitute a piano. The steel wires and iron frames must necessarily alternately expand and contract with the variations of the surrounding atmosphere, and hence a constant movement of the wires and a change in the pitch of their tones; and when one reflects on the immense strain on the body of the instrument, caused by the tension of the strings, equaling the weight of no less than *one hundred thousand pounds*, and upwards, it becomes a matter of no surprise that a piano that will stand perfectly in tune is an instrument that has not yet been made.

Another important thing to be done to preserve a piano in order, is to keep out the moths. Cloth is used in pianos to a considerable extent, being placed wherever there is liability to contact between any of the numerous movable portions of the instruments, in order to avoid the rattling and noises incident to such contact. Of course when this cloth is destroyed by the moths, the noises referred to ensue. Experience has shown that moths generate rapidly where dust is allowed to accumulate, and the best way to keep the pianos free of dust is to use a large feather brush at least once a week.

In reference to the tuning of a piano, it should be generally understood that tuning consists simply in tightening and relaxing the strings to the requisite degree, and does not include a general renovation and repair of the instrument, as many people imagine. New pianos require tuning once a month, and none should be allowed to go untuned over three, the reason being that the longer an instrument remains untuned the lower its pitch of tone, and consequently the greater the strain made upon the instrument when it is required to be drawn up to "concert pitch," and when it is thus raised in tone a double tuning is necessary, for the first drawing, up causes the case to yield gradually, and in a week or two the piano is out of tune.

Some pianos cannot be placed in tune at all, owing to the falseness of the "scale," or mathematical measurement of the division of sounds, by which the single wire is made to give out a double tone. Others again will not remain in tune from the causes above described, the principal one being the looseness of the pins holding the wires in the pin-block.

We think we have now plainly proved to those about to purchase pianos, that those made by reliable and well-known makers, no matter how high their price may be, are in reality the cheapest instruments in the end; and to those possessing pianos, that freedom from artificial heat, cleanliness in preserving them from moths, and regular tuning, are requisite to keep their instrumeuts in good order for enjoyable use.

HOFFMAN'S EYELESS PICK.

This pick is peculiar in its construction and is intended to reduce the cost of manufacture and tendency to break which the ordinary tool is liable to. The pick itself is formed from a steel bar, and is perfectly flat on its sides. It is inserted in the square socket, A, which has a chock piece, B, immediately below the pick; this chock is secured in place by a pin which is tapered so as to drive the chock up against the pick and hold the same firmly in its place. The other end of the socket has a hole for a handle which is also secured with a pin. This socket, etc., which carries the pick is made entire in one forging, and the piercing part, or blade of the tool, while it is held strong, in the way indicated above, can be quickly removed to be sharpened or tempered, as occasion may require.

This pick was patented by George Hoffman, of Scott River, Siskiyou county, California, on May 12th, 1863. For further information address him at the above place.

New Plan of building Ships.

A daily contemporary thus describes a new method of building ships recently invented by Mr. Ariel Patterson, of Williamsburg, N. Y:—

"Let the reader imagine the kelson or inner keel in place, as the foundation of the whole fabric, and then that a series of strips of oak planking are drawn under this, in a line diagonal to the direction of the keel, and bent till their ends come above the deck at the sides. These strips, bent to the form of the model, and continued from the middle to each end, would constitute a hull of planking, as free from and independent of ribs and knees as a canoe itself. The next operation in the process is to lay over this first shell of oak a second and a similiar thickness of the same material, only this is laid diagonally in the opposite direction, so that the slabs cross each other instead of lying parallel. The hull is then ready for the keel, which is attached by trenails or long locust bolts an inch and three-eighths in diameter, and which pass completely through all from the outside of the keel to the upper surface of the kelson, binding the whole into one solid mass. The upper ends of the planking are bound in the same manner to the clamps, oaken beams, which go entirely round the vessel to give to it its upper line and the form of the deck. The craft is now ready for her planking proper, which is put on in the usual manner fore and aft. Here we have three several oak layers of two and a half inches each, or a hull seven and a half inches thick throughout. This prodigious strength is further increased by the mutual bracing which results from the crossing of every individual plank by every other, through the entire thickness of the hull.

"The next peculiar feature of this novelty is the framework of the deck. This consists of two series of beams laid diagonally to the length of the vessel, but at right angles to each other, and two feet apart These are mortised together at their intersections, and into the clamp along the sides, and then are ready for the planking, which is laid on in the customary way fore and aft. Here we observe precisely the same principle as that pervading the hull, namely, three different series of parts, all laid in directions crosswise to each other, and by that means imparting a great additional flexibility and strength to the whole structure. Mr. P. claims that this deck is incomparably stronger than if built in the old style, while there is at least twenty-five per cent less timber in it. We heard sea captains and other nautical men admit the justice of the claim yesterday, and we are quite sure they are not too liberal.

"This vessel is building for Capt. Stearns and Captain Lowber, of New York, and is intended to lighter sugar. Her strength may be inferred from the following dimensions:—Beams of deck frame 6x6 inches in one direction, and 6x8 in the other; deck plank, $2\frac{1}{2}$ inches; clamp 12x6; water way 10x6—the deck frame ends set in between these two latter and are trenailed through and through; bilge streak (oak) 17x5 inches, running the whole length on each side, kelson (oak) 14x7 inches; garboard streak (oak) 14x3 inches; keel (oak) 15x12 inches; shoe 12x10; length 65 feet on deck, 26 feet beam, and 6 feet deep.

"The locust trenails used by Mr. P., as we have said, are $1\frac{3}{8}$ inches thick, but these, before insertion, are submitted to a process called 'compression.' This process reduces the diameter of each trenail one eighth of an inch, and is performed by mechanism of Mr. P.'s own invention, and for which he took out Letters Patent some five or six years ago. The locust after insertion in the hull and exposure to the damp seeks to regain its normal bulk, and consequently binds in the bore with prodigious tenacity. In addition to this each trenail is sawed off clean on the inner and smaller end, split and very carefully wedged.

"The advantages which most prominently suggest themselves in connection with this improvement are, first, the durability and strength resulting from the nature and disposition of the material; secondly, economy and expedition of construction; thirdly, the superior capacity of the hold for stowage, so clear of knees and all other projections; fourthly, a more water-tight ship, as the caulker has only to fill the outer seam with oakum, which will rest on the next inner laying of planking, enabling the workmen to make the caulking as hard as the oak itself."

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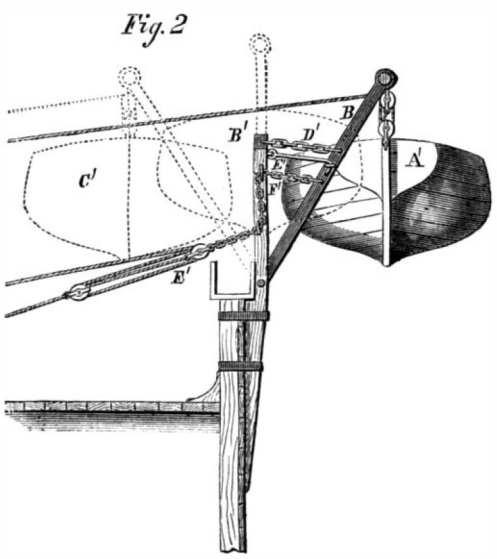
Correspondence

Forbes's rrangement for lowering Ships' Boats.

MESSRS. EDITORS:—Herewith I send you a plan for hoisting and lowering ships' boats, through which they can be stowed on deck without the use of yard and stay tackles. It consists simply of two posts or "stanchions" bolted to the side of the ship, attached to which, at the point where they intersect the hammock rail or the hurricane deck, are flat iron davits. Fig. 2, shows the boat in three positions:—A′, ready to lower; B′, stowed for ordinary sea use, or where saluting or fighting; C′, ready to lower on deck, or suspended inboard to avoid the risks of collision in boarding. In position, A′, the davit may be variously supported; the simplest way, perhaps, is as shown by a chain, D′, it may also be done by a flat bar with free ends working on bolts in the davit and in the stanchion, and having a joint in the center, or by a hook and strong staple, as shown at E′. This also serves as a brace to keep the davit out to its place when the ship is rolling. At F′, a chain and tackle is shown to hold what is got in moving to the upright position, B′, and also to ease the boat down gradually to position, C′.

Fig. 1, shows a fore-and-aft view of the boat stowed in position, B′. The davits are kept steady by a permanent spar to which the boat is attached; this spar turns in iron gudgeons working in the ends of the bar davits; it is further steadied in a fore-and-aft direction by permanent guys, D, of rope or chain, which, being set up in a line with the bolt holding the davit to the stanchion, are always "taut," or tight, as landsmen would say. E, represents the gripes, and G, the line of rail; the weight of the boat is partly taken off of the spar and davits by being landed in supporters or crotches, F, which turn down flat when the boat is to be lowered. The seaman will readily perceive that by this simple arrangement the boats—where the shrouds do not interfere—

Fig. 2



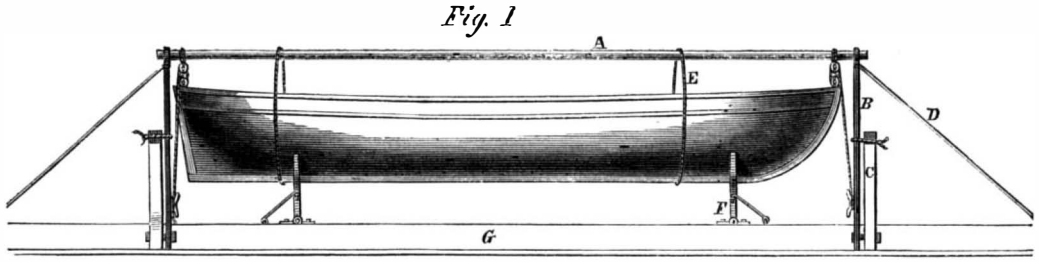
are always ready to put out or to be taken in board. The plan is specially useful for vessels having no yards to hoist the launch or for those with "hurricane" decks. In vessels of the latter class there should be no "fly rail" abreast of the boats, and they need not come above the plankshire or covering board more than a foot, and may be landed either in permanent or movable chocks.

In vessels-of-war, as is well known, the boats are generally much in the way of damage by the concussion of heavy guns; in saluting they are generally lowered, but in fighting at sea they must be kept in place, not only much exposed to damage by the concussion of one's own guns, but by shot from the enemy; the latter cannot be avoided by any means, and in case of being run into for the purpose of boarding, or by accident. the boats, as usually stowed, are the first to suffer by the shock. In my plan they can be swung in at a minute's notice, and in case of any disaster, involving the sinking of the ship, the lives of the crew are more likely to be saved by having the heavy boats practically always ready to put into the water; though to speak the simple truth such boats as are universally supplied to war ships are not very good vehicles for saving life, for there is not a *bona fide* "life-boat" in the navy that I know of.

R. B. FORBES.

Boston, May 3d, 1864.

Fig. 1



Obtaining Neat's Foot Oil.

MESSRS. EDITORS:—In an article copied into the SCIENTIFIC AMERICAN of the 21st of May, the practice of breaking the bone between the knee and the hoof is advised. This is an error: the oil can all be obtained by boiling without breaking; and the bones are worth as much as the oil, being useful in the manufacture of buttons, of tooth-brush handles, of ferrules, etc. The proper way is first to strip off the tendons, which should be steeped with lime preparatory to making glue of them; secondly, after washing, boil the leg and hoof well and skim off the oil, as the writer directs; thirdly, throw the bone into cold water, and subsequently keep it from the sun and heat to prevent cracking; fourthly, preserve the hoof for the manufacture of Prussian blue, or for the manufacture of buttons and other articles in heated matrices by the new process; and fifthly, apply the residuum in the boiler and in the lime-vat to the soil. Five values instead of one are thus obtained. ***

Absinthe Poison.

We find in *La Science Pour Tous* the following note from Mr. Marcy:—

"Some decidedly marked symptoms distinguish simple alcoholic intoxication from intoxication by the aid of absinthe liquor. Those who abuse the latter poison experience stupefaction and terrifying hallucinations, and the enfeebleness of the intellect advances with extreme rapidity. These clinical differences suggest the supposition that absinthe by itself exercises a special action. In order to verify this hypothesis, I have sought to isolate, by the aid of experiments on animals, the poisonous effects due to absinthe from those which result from alcohol.

"Pretty numerous facts, observed on dogs, and rabbits which have been made to swallow the pure essence of absinthe leave no room to doubt the poisonous action of this substance.

"The essence of absinthe, in doses of 2 and 3 grammes, induces trembling, stupor, insensibility, and all the appearances of a profound terror. If the dose is raised to 5 and 8 grammes, it leads to convulsions like those of epilepsy, with involuntary evacuations, froth on the lips and stertorous respiration. These symptoms pass off, and do not result in death.

"These experiments appear to me worthy of interest, and prove that the absinthe liquor exercises a double toxical action which explains its effects on the nervous system."

GREAT GUNS FOR HARBOR DEFENSE.—"Norman Wiard was congratulated to-day by a high official in the Navy Department upon the successful casting of his great cast-iron gun at Trenton, as the beginning of a new era in harbor defenses and marine warfare."

[The above important intelligence was communicated to the *Tribune* by a special telegram. We have not heard from Mr. Wiard since, but presume he is, doing well.—EDS.

AFTER a series of experiments for nearly two years military ballooning has been declared a failure, and all the apparatus has been sold off at auction.

The Ancient Glaciers of Europe.

In an article in the last number of the Atlantic Prof. Agassiz discusses the evidence of the existence of glaciers in Scotland and other parts of Europe in ancient times. He comes to the conclusion that there was a period when the climate of northern Europe was so much colder than at present, that the summits of all the mountains were covered with perpetual snow, and all of the valleys upon their sides were filled with rivers of ice, similar to those which are now moving slowly, constantly, and with irresistible force down the valleys of the Swiss mountains. He says:—

"I have dwelt thus at length on the glaciers of Great Britain because they have been the subject of my personal investigations. But the Scotch Highlands and the mountains of Wales and Ireland are but a few of the many centers of glacial distribution in Europe. From the Scandinavian Alps glaciers descended also to the shores of the Northern Ocean and the Baltic Sea. There is not a fiord of the Norway shore that does not bear upon its sides the tracks of the great masses of ice which once forced their way through it, and thus found an outlet into the sea, as in Scotland. Indeed, under the water, as far as it is possible to follow them through the transparent medium, I have noticed in Great Britain and in the United States the same traces of glacial action as higher up, so that these ancient glaciers must have extended not only to the sea-shore, but into the ocean, as they do now in Greenland."

Patent Fishing Lamp.

A foreign journal says:—"We were recently favored with a private inspection of this invention which was exhibited in the mill stream near the Ferry House, Tottenham Mills, England.

"It is considered by many practical men as a most important invention, and calculated to be of great service, not only to the fishing trade, for which it was specially formed, but also to the diver, in his examination of submerged ships, etc. It is a well-known fact that light has a great attraction for fish, and that fishermen therefore use it to allure them toward their nets. But these have always been placed on the top of the boats. By Mr. Fanshaw's invention, a lamp can be let down some twelve feet or more into the water, and so allure the fish to a greater depth than has hitherto been practicable. A short description of this invention may not prove perhaps uninteresting to our readers.

"It consists principally of a lantern, air-tight and water-tight, having a double roof to rarefy the air, from which it is conveyed by pipes to the foot of the burner. This air is supplied by means of a flexible tube, and a similar tube is fitted to the roof to carry off the smoke and consumed air. The lamp, when we saw it, was burning most brightly, and casting a glare around for many feet, and attracting a large quantity of fish. It was then supplied with oil, but can be so constructed as to consume gas, when of course the glare will be greater. It is lowered by means of a winch, fitted to the covering of the lamp. It is intended to be fixed in the center of a boat, and can be made of a size to suit the latter."

Mr. Fanshaw is the inventor of this lamp.

The Philadelphia Boiler Explosion.

The jury in this case—composed of the gentlemen whose names are appended, three of whom are practical, mechanical engineers of great ability—have rendered a verdict. They say:—

"We therefore render the following verdict:—That on the 25th of April, 1864, William Bartholomew, Alfred Schaffer, Samuel Davis, Thomas H. Albertson, George Hess, J. L. Snyder, John Porter, and Anthony S. Fry, came to their death by reason of injuries inflicted by the explosion of a steam boiler in the establishment of Messrs. Cornelius & Baker, Cherry street, below Ninth, Philadelphia, the primary cause of said explosion being the weakness of a part of the boiler known as the mud-boiler. Coleman Sellers, R. E. Rogers, John W. Nystrom, John

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F. Frazer, Henry Morton, Samuel J. Cresswell.

They also say :—"Messrs. Cornelius & Baker are, like thousands of others using steam power, not professional engineers; they therefore depend upon the advice of others in regard to all matters connected with their steam-generating apparatus. Their responsibility would seem to rest with the choice of advisers and with their close supervision of those under them in responsible positions. We believe that they have in the latter case been careful in selecting an engine tender, and watchful over his actions; we can find no testimony to impeach the sobriety or competency of this engine tender; but we believe he has not made as careful and as frequent examination of the internal condition of the mud-drum as he should have done; but in this he is not singular; we have heard, and are hearing daily, since this explosion, of mud-drums giving out in various parts of the city, and the warning has led to an examination of others which, although they have not exploded, are too thin to be safe."

[All the leading journals of Philadelphia concur in expressing the opinion that Messrs. Cornelius & Baker had exercised every precaution in their arrangements and endeavored to make assurance doubly sure. They are not to be held to blame for the accident or the result of it, but as the jury say in their verdict, the corrosion might have been discovered by the man in charge of the boiler.—Eds.

THE LAW AND PRACTICE OF RE-ISSUES.

An important question was lately presented to the Commissioner of Patents by the application of Mr. Andrew Whitely for the re-issue of Letters Patent under which he held only a sectional interest.

The Commissioner, in conformity with the past practice of the office, refused the re-issue, on the ground that the law does not authorize a re-issue to an assignee holding less than the entire property in the patent, althouge he admits that it is the uniform practice of the office to grant a re-issue to the patentee himself, even when he does not hold the entire property in the patent.

We have not seen the arguments used by the counsel in this case, but we have before us the printed "Opinion of the Commissioner," prepared, we are informed, by the chief clerk of the Patent Office, who is a lawyer by profession. Mr. Hayes, in this "Opinion," has given the practice of the office, the law upon which it purports to rest, and the opinions of several of the judges of the Supreme Court upon some of the questions which arise in construing the law.

The authority for the surrender and re-issue of Letters Patent is found in § 13 of the Patent Act of 1836, which reads as follows, leaving out those sentences which do not bear on this inquiry:—

"§ 13. Whenever any patent which has heretofore been granted, or which shall hereafter be granted, shall be inoperative or invalid by reason of a defective description . . . it shall be lawful for the Commissioner, upon the surrender to him of such patent, and the payment of, &c., . . . to cause a new patent to be issued to the said inventor for the same invention, for the residue of the period then unexpired for which the original patent was granted, in accordance with the patentee's corrected description and specification. And in case of his death, or any assignment by him made of the original patent, a similar right shall rest in his executors, administrators or assigns, and the patent so re-issued, together with the corrected description and specifications, shall have the same effect and operation in law, &c."

§ 6, of the Patent Act of 1837, enacts, "that any patent, hereafter to be issued, may be made and issued to the assignee or assignees of the inventor or discoverer, the assigment thereof being first duly entered of record, and the application therefor being duly made, and the specification duly sworn to by the inventor."

§ 13, of the act of 1836, clearly puts the inventor and his legal representatives or assignees upon the same footing with respect to re-issues, while § 6 of the act of 1837 enables an assignee to take out an original patent in his own name, and thus be entitled to the designation of patentee. It will be seen that § 13 uses the words *inventor* and *patentee* as convertible terms, but the § contains proof in itself that the inventor alone is meant in the first part of the section, and the legislator who framed the bill ought to have carried along in his mind that a preceding § (10) recognizes persons as patentees who are not also inventors, for it expressly authorizes the legal representatives of a deceased inventor to become patentees. But this looseness of phraseology does not bear upon the present inquiry, because the effect of § 6, act of 1837, and of the last clause of our quotation from § 13, is to invest legal representatives and assignees, in certain cases, with the same rights as the inventor himself, in taking out Letters Patent in their own names.

Mr. Hayes, in this "Opinion," has explored the ground which is covered by the controversy with much learning, and we need not look beyond his researches for authorities and guides in examining the question for ourselves. But he must allow us to state our surprise that after examining the statute, and applying thereto the settled principles of interpretation, he comes to the conclusion that it is "wiser to continue to tread in the ancient paths, and not to change a practice sanctioned by the wisdom of my predecessors."

For ourselves, we object to a conclusion founded on the assumption that the ancient paths and practices of the patent office are beyond amendment. We can enumerate several changes which the enlarged views of modern Commissioners have impelled them to make; and, upon a pinch, we might enumerate others which a proper appreciation of the mighty agency of the inventive genius of the country upon social and political life would speedily bring about. The law of 1836, which Mr. Hayes regards as a monument of legal precision, is yet, judging from his reasoning, not so clear a statute as to justify the present Commissioner in doing, what he expressly says on page 7, of the "Opinion," "would be conformable to public expediency, and a sound construction of the law," when the new construction (though, as we shall see, enjoined by the Supreme Court of the land) goes against the "ancient practice."

That the country may have a clear idea of this important question, we will try to ascertain what the law has been construed to mean. We have quoted § 13, act of 1836. The Supreme Court in December, 1861, says that "a surrender of the Patent XXX. (for re-issue) extinguishes the Patent. It is a legal cancellation of it, and hence can no more be the foundation of a right after a surrender than could an act of Congress which has been repealed." There are previous decisions of inferior courts which assert the contrary doctrine. All such are, of course, to be henceforth disregarded.

What is a surrender? It is not the personal act of delivering the original Letters Patent merely. For a patentee or assignee who holds the patent and does not own all the rights created by it, cannot, at his pleasure, destroy the rights he does not own. Therefore a surrender implies that he who gives up the Letters Patent gives up also the entire property created and existing under it. An actual concentration of all such property in him is not necessary, but there must be a concurrence of all the parties interested. It is not to be held, however, that in case a new patent does not re-issue from any cause, as from the refusal of the Commissioner to consent to the changes demanded, that the original patent is dead. It is sound common sense to hold that the actual cancellation of the original does not take place until the Commissioner has issued a new patent, for until that is done the whole transaction is not completed. The surrender and receiving of the patent must be taken as one act, and it is not an act accomplished until the new patent is issued. Therefore the Patent Office does right in returning to the patentee the original patent whenever it refuses the changes asked for. The country may ask why and upon what grounds the Commissioner, after the decision of the Supreme Court of December, 1861, continues to re-issue Letters Patent to patentees who hold only a part of the rights created by the patent? We cannot answer the question. The "Opinion" before us gives no reason save the wisdom of "treading in the ancient paths."

Again, the country may ask why the Commissioner makes a difference between a patentee holding a sectional interest, and an assignee holding a sectional interest? If the Supreme Court erred, and the ancient practice is correct, why discriminate against an assignee, when the law does not? We have seen that a patentee need not be the inventor. If he is an assignee before the issuing of the patent, it may be issued in his own name, and then he is called patentee. If afterwards, then he gets the same property rights, but not being named in the patent, he is then called assignee. But the difference is only in the name, not in the thing. The property rights are the same. He is the same man, with the same rights, in the courts, no matter what his designation may be.

We hope the Commissioner will give further attention to this subject, and, if the decision of the Supreme Court of December, 1861, is the law of the land, that he will enforce it against all who, holding sectional interests, seek re-issues; and if it has been subsequently overruled by the Court, that he will do what the law does—give equal rights to all who surrender Letters Patent with the entire interest therein, whether called assignees or patentees.

RELATING TO PATENTS.

It may be well for parties who are interested in new inventions to remember that our firm of Munn & Co. have taken out far more patents, and have therefore had much greater experience in the profession, than any other agency in the world. Those who confide their business to us may therefore rely upon having it done in the best manner on the most moderate terms.

In addition to these advantages, we make it a general rule to assist the interests of our clients by giving publicity, in the form of editorial notices, of all the new and meritorious inventions that are patented through our agency. The fact that we have carefully studied these improvements during the process of preparing the patent papers, enables us to speak knowingly in regard to their best features. The publicity thus given to inventions, owing to the immense circulation of the Scientific American among intelligent readers, is often of the utmost benefit to patentees. In some cases it has engaged the active co-operation of enterprising capitalists and manufacturers, in patents which otherwise would have remained dead, and has resulted in the most important pecuniary advantages to inventors and patentees, as hundreds of them are ready to testify; although the sum total of our charges for preparing their patent papers has rarely exceeded the small amount of twenty-five dollars. Whatever carping, jealous or envious persons, or little agents, may say to the contrary, we are justified in affirming that all who really wish to promote their own interests will do well to employ the Scientific American Patent Agency.

A Heavy Forging.

The Pittsburgh *Dispatch* says that one of the most intricate pieces of forging ever attempted west of the Alleghenies has just been completed by Wm. Porter & Co., of Temperanceville. The mass is designed for the stern of the iron-clad *Umpqua*, now building in Monongahela borough, and is designed to support and resist the thrust of the two properlers with which that vessel will be furnished. The bearings for the propeller shafts are eight by twelve inches, and are separated nine feet six inches by an oval rail, seven niches broad by two inches thick. They are supported from the keel plate by similar oval braces, seven inches broad and three inches thick, the three rails forming a massive, inverted triangle, some six feet from base to apex. The huge lugs by which this triangle is fastened to the frame of the vessel are four feet long, eight inches broad, and three inches thick, and are united to the bearing, one to each bearing by a short connecting rail. No mere verbal description could convey a just idea of the difficulty of forging such a mass of iron, in such a shape, and at one time it was not supposed that the work would be undertaken here. The forging will be temporarily fitted in its place this week, and will then be planed, bored for the shafts, and permanently fastened.

Mr. Cyrus W. Field contradicts the statement that the *Great Eastern* has been sold to the French Government. An agent of that Power applied for her and was told that after the Atlantic cable was laid she could be purchased for £250,000.

Ammonia is composed of 3 atoms of hydrogen to 1 of nitrogen, H_3N; by weight 3 lbs. of hydrogen to 14 of nitrogen.

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THE WAY THE LIFE OF THE EARTH CAME FORTH.

We mentioned some time since the receipt of "Dana's Text Book of Geology," intending at the time to give on another occasion a somewhat extended sketch of its contents. These hand-books are excellent mile stones that mark the progress of any science, and an examination of this little work impresses us with the vast stride that has been made in geology since we listened to Silliman's lectures on the science twenty years ago.

Prof. Dana ignores the existence of the Taconic system, and commences his history of the fossiliferous rocks with the Potsdam sandstone. At that time, he says, the continents or islands of the earth were few and small, and the surface of our globe was nearly covered with the waters of a warm and shallow ocean. There was no land plant or animal upon the earth, and the lowest forms of both animal and vegetable life had just begun to make their appearance in the seas. The progress of the earth's history is thus summed up by our author:—

"There was *first* an age, or division of time, when there was no life on the globe; or, if any existed, this was true only in the later part of the age, and the life was probably of the very simplest kinds.

"There was next an age when shells or mollusks, corals, crinoids, and trilobites, abounded in the oceans, when the continents were almost all beneath the salt waters, and when there was, as far as has been ascertained, no terrestrial life.

"There was next an age when, besides shells, corals, crinoids, trilobites, and worms, there were fishes in the waters, and when the lands, though yet small, began to be covered with vegetation.

"There was next an age when the continents were at many successive times largely dry or marshy land, and the land was densely overgrown with trees, shrubs, and smaller plants, of the remains of which plants the great coal-beds were made. In animal life there were, besides the kinds already mentioned, various amphibians and some other reptiles of inferior tribes.

"There was next an age when reptiles were exceedingly abundant, far outnumbering and exceeding in variety, and many also in size and even in rank, those of the present day.

"There was next an age when the reptiles had dwindled, and mammals or quadrupeds were in great numbers over the continents; and the size of these quadrupeds, like that of the reptiles in the preceding age, was far greater than the size of modern species.

"After this came man; and the progress of life here ended.

"The above-mentioned ages in the progress of life and the earth's history have received the following names:—

1. Azoic Time or Age.—The name is from the Greek, *a*, *not* or *without*, and *zoe*, *life*.
2. Age of Mollusks, or the Silurian Age.
3. Age of Fishes, or the Devonian Age.
4. Age of Coal-plants, or the Carboniferous Age.
5. Age of Reptiles, or the Reptilian Age.
6. Age of Mammals, or the Mammalian Age.
7. Age of Man.

"The first of these ages—the *Azoic*—stands apart as the preparatory time for the commencement of the systems of life. The next three ages were alike in many respects, especially in the air of antiquity pervading the tribes that then lived, the shells, crinoids, corals, fishes, coal-plants, and reptiles belonging to tribes that are now wholly or nearly extinct. The era of these ages has, therefore, been appropriately called *Paleozoic time*, the word *Paleozoic* coming from the Greek *palaios*, *ancient*, and *zoe*, *life*.

"The next age was ushered in after the extinction of many of the paleozoic tribes; and its own peculiar life approximated more to that of the existing world. Yet it was still made up wholly of extinct species, and the most prominent of the tribes and genera disappeared before or at its close. This age corresponds to *Medieval* time in geological history, and is called *Mesozoic time*, from the Greek *mesos*, *middle*, and *zoe*, *life*.

"The next age was decidedly modern in the aspect of its species, the higher as well as lower, although only a few of those of its later epochs survive into the age of man. It is called *Cenozoic time*, from the Greek *kainos*, *recent*, and *zoe*, *life* (the *ai* of Greek words always becoming *e* in English, as for example, in *ether*, from the Greek *aither*.)"

The book is then devoted to a history of these several ages in the order of the periods into which they have been subdivided. This history of the gradual coming forth of life upon our globe is unmistakably and indelibly preserved in the fossil remains which are found in the rocks; its great characteristic is a steady progress from low and simple to higher and more complex forms of organization.

Prof. Dana accompanies this history of organized beings with an account of the slow formation of the continents, especially that of North America. He describes its original conformation, nearly the same as at present, beneath the shallow waters of the Atlantic, and narrates in detail the successive elevations and depressions by which the rocks were first formed in the broad shoals along the shore, and were then lifted into mountains and plateaus.

The book is written in a clear and pleasant style, and is protusely illustrated with wood-cuts, some of them as fine as any we ever saw. We noticed a few errors. "Doubling the rate of flow increases *sixty-four* times the force of the water" This blunder doubtless originated in Prof. Dana's school-boy days, and resulted from a confusion in his mind caused by a common illustration of the law, that the force of a moving body is in proportion to the square of its velocity. By an error in grammar he states that Mr. Mitchell's body was 28 feet long. These are trifles, however; but the pertinacity with which the New Haven people refuse to recognise the Taconic system seems to us, in the present state of the evidence, to manifest a want of the candor which should characterize men of science.

Prof. Dana frequently alludes to the Mosaic record as being in accordance with the facts of geology, and he concludes his work in these words:—

"It is also certain that science, whatever it may accomplish in the discovery of causes or methods of progress, can take no steps toward setting aside a Creator. Far from such a result, it clearly proves that there has been not only an omnipotent hand to create, and to sustain physical forces in action, but an all-wise and beneficent Spirit to shape all events towards a spiritual end.

"Man may well feel exalted to find that he was the final purpose when the word went forth in the beginning, *Let light be.* And he may thence derive direct personal assurance that all this magnificent preparation is yet to have a higher fulfilment in a future of spiritual life. This assurance from nature may seem feeble. Yet it is at least sufficient to strengthen faith in the Book of books in which the promise of that life and 'the way' are plainly set forth."

The Production of Artificial Cold.

In a quaint old paper published at Philadelphia in the year 1787, we find this description of a process for obtaining cold by chemical mixtures. It runs as follows:—

"AN ACCOUNT OF SOME NEW EXPERIMENTS ON THE PRODUCTION OF ARTIFICIAL COLD. BY THOMAS BEDDOES, M.D.

"These curious experiments were made by Mr. Walker, apothecary to the Radcliffe Infirmary at Oxford. That many saline substances have the power of producing cold during their dissolution in water, has long been known; but Mr. Walker is the first who, by a happy *combination* of those powers, has produced at once a degree of cold sufficient to freeze water in the hottest day in summer. The ingredients, and proportions, which seem to have answered the best, are 32 parts, by weight, of water, 11 of sal ammoniac, 10 of niter, both dried and powdered, and 16 of Glauber's salt, retaining its water of crystallization: the sal ammoniac, put in first sunk the thermometer (which stood in the air at 65°) to 32; the niter, added afterwards, sunk it to 24; and lastly, the Glauber's salt to 17.

"Nitrous acid poured on Glauber's salt, was found to produce effects nearly the same as when it is poured on pounded ice. The concentrated nitrous acid was first diluted with half its weight of water, and 9 parts of this mixture (cooled to the temperature of the atmosphere) were poured on 12 of Glauber's salt: the thermometer, which stood at 51°, sunk to 1 below 0; and, on adding 6 parts of sal ammoniac, it fell 8° further, in all 60°. By means of this mixture, Dr. Beddoes himself froze, in a few minutes, a vinous spirit above proof; and another gentleman sunk the thermometer 68°.

"By a combination of these mixtures, Mr. Walker effected the congelation of quicksilver, without a particle of snow or ice. When he began the experiment (April 20, 1787), the temperature of the mercury was 15°; so that the freezing point of that metal being 39 below 0, there were produced 84° of cold. The apparatus for this purpose consisted of four pans, progressively diminishing in size, placed one within another, and the outermost in a vessel still larger. Some of the materials for freezing mixtures were put in each of these pans, and others in vials, in the spaces between them; so that those in the outermost pan received, before being put together, the cold produced by a frigorific mixture in the larger vessel; and those in each of the inner ones received, in like manner, the successively increased cold of the pan next without it.

"It is observable that Glauber's salt, while it retains its water of crystallization, produces, on the addition of oil of vitriol diluted with an equal weight of water, 46° of cold; but, when it has fallen into powder, that is, when dried or deprived of its water of crystallization, it rather produces heat than cold; and the case is the same with mineral alkali in two different states. The Doctor accounts for this difference, from the crystals containing a large quantity of water in a solid state, from which state it cannot return to fluidity (any more than from that of ice) without absorbing a determinate quantity of heat from the contiguous bodies. Bnt it should be observed at the same time, that Mr. Walker found, as Boerhaave had done before him, both sal ammoniac and niter, when *well dried in a crucible*, and reduced to fine powder, to produce a *greater degree of cold* than if they had not received this treatment."

The same journal also gives this recipe:—"AN IMPROVED METHOD OF MAKING THE COFFEE BEVERAGE.—To an ounce of ground coffee add a common teaspoonful of the best flour of mustard seed, previous to the boiling. To those unacquainted with the method, it is inconceivable how much it improves the fragrancy, fineness, transparency and gratefully quick flavor of the beverage; and probably too, it adds to its wholesomeness." Those interested can try it at all events.

Change wrought by Labor-saving Machinery.

Those who are familiar with our agricultural condition as it was twenty years since, find it difficult to realize the vast changes which have taken place since then. The listlessness which characterized the farmers twenty years ago has, to a great extent, disappeared, and has given place to a feeling of interest and a display of enterprise and energy, which has already advanced, and in the future, undoubtedly will greatly advance the interests of agriculture. These striking changes are the more noticeable and gratifying, because they have been wrought, not in a few individual cases, but pervade almost the entire community. During the past three years this progressive spirit has manifested itself more fully than for a dozen of years previously. This is attributed mainly to the fact, that the demand for soldiers has withdrawn a large portion of farm laborers, and farmers, as a consequence, are compelled to avail themselves of every expedient by which their toils may be lessened, and the crops put in and harvested at the proper seasons. Those who a few years since clasped their pocket books with an almost miser's grasp, and obstinately resisted every effort to induce them to keep pace with the progressive spirit of the age, have, in consequence of the scarcity and high price of farm help, been compelled to relax their grasp, and avail themselves of the benefits of the reaper and mower, the horse-rake and the unloading-fork, and all the improvements in farm machinery, which the wants of our people have demanded, and their ingenuity have called forth. These new and valuable improvements have swept away long-cherished prejudices, and but for them our country would be in a condition, so far as its agriculture is concerned, that would be deplorable beyond description.—*Philadelphia Cultivist.*

A MAN in Michigan is now making from two to three barrels of turpentine per day.

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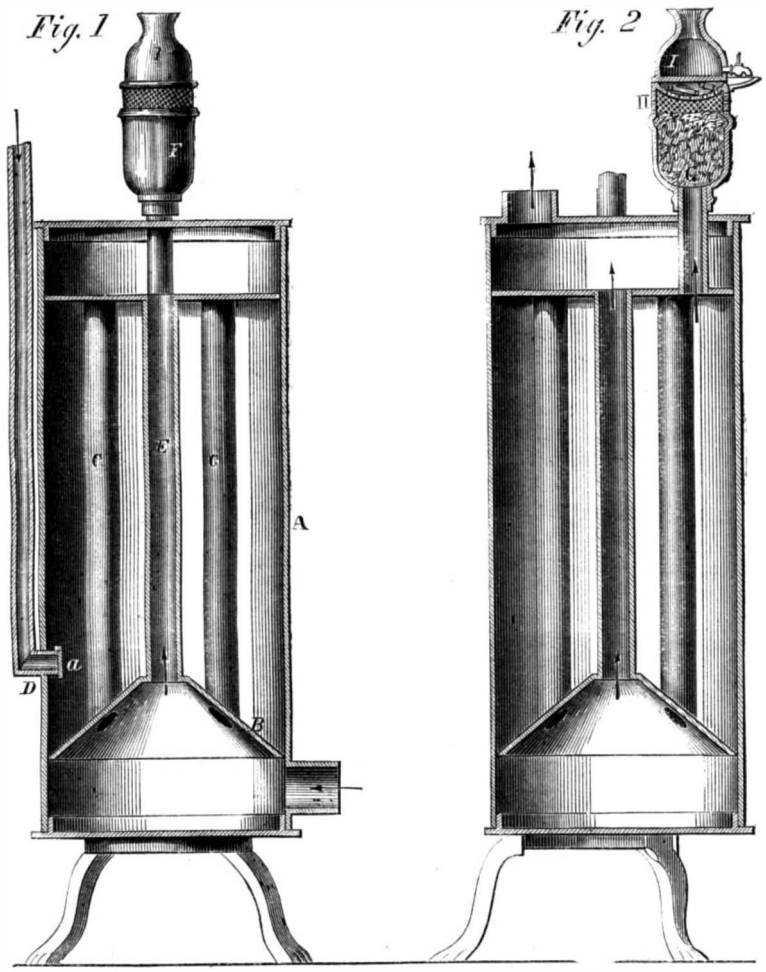
Improved Stove Ventilator.

The ventilator illustrated herewith is of a peculiar character and is specially intended for schools, theaters, public buildings, etc. The inventor claims that it is very economical of fuel, or that it effects a saving by warming the air in a much shorter time than it could be done by a stove without this arrangement. This effect is obtained by passing the heated gases or products of combustion through a pipe directly into the room instead of up the chimney, said gases being purified so that they do not vitiate the air or unfit it for respiration. In Fig. 1 the ventilator is shown setting upon legs independent of the stove itself; it may be thus constructed, or in cases where space is an object, as in railway cars, set directly over the stove itself. The case, A, is made of sheet-iron and has a conical bottom, B, set in it; this connects by the flues, C, with the other end, which is open to the chimney. At D a cold-air pipe provided with a valve, *a*, enters the case; this conducts a current of fresh air from the outside of the room into the case, A. The central flue, E, extends upward through the case, A, and has an arm, F, at the top, which is furnished with a sponge, G. The urn, has also a perforated center at H, open to the air, The top, I, of the urn is filled with water and contains a faucet which allows water to drip down on a perforated bottom, in such a manner that it is equally distributed over the surface of the sponge placed therein. It will be seen, says the inventor, in his description, that as the smoke and hot air rises through the flues, a portion of it goes upward to the chimney to maintain the draught, while another portion goes through the central flue, permeates the damp sponge, and issues into the apartment through the network opening. In this way a genial and pleasant heat is given off, and the room rendered much more safe, in a sanitary point of view, than with a dry atmosphere. The ends of the heater are made to be taken off, so that the flues and interior may be cleaned out. The whole apparatus need not exceed three feet in hight. This invention was patented Feb. 21, 1863, through the Scientific American Patent Agency, by E. C. Gillette, of San Francisco, Cal. For further information address the inventor at that place, or Henry Lyon, 119 Nassau street, New York.



GILLETTE'S VENTILATOR FOR STOVES.

A Sugar Refiner's Opinion of Sorghum.

Mr. Belcher, of the well-known firm of Belcher & Bros., St. Louis, Mo., recently gave the following interesting facts in relation to sorghum to the editor of the *Wisconsin State Journal* :—

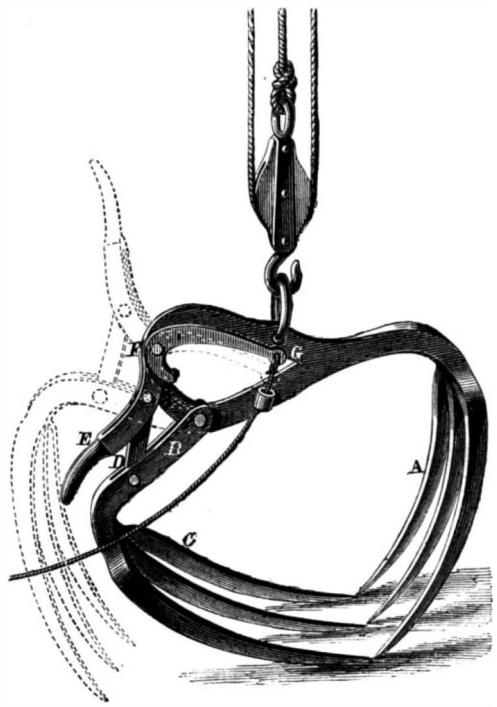
"He says that in the fall and winter of 1862, they refined at their Chicago refinery many thousands of gallons of sorghum sirup, and made of it an elegant article of *golden sirup*, that easily sold in the market at good prices under various fancy names, not being understood to be sorghum sirup at all. They sold it as golden sirup rather than sorghum because it was really a good article, and because golden sirup had already an established reputation, and sorghum had not.

"Mr. Belcher said there is no trouble in making a first rate article of golden sirup of any good light colored sorghum, and without much diminution or expense. That from ten to fifteen cents per gallon would cover the cost and shrinkage and make an article that would sell in any market of the world for a good price, and no one could tell what it was made of. He said that he had no doubt but what good sorghum sirup would be worth 75 cents per gallon at wholesale next fall in any quantity that may be offered, and that probably no country in the world would, at least for a long time, be able to produce a good sirup cheaper than the rich prairies of the West. He thought the farmers ought to and would grow it extensively as a commercial crop, just as soon as they come to realize its great value and profitableness as a farm crop, not merely for sirup, but for many other important purposes and uses to which it would be put.

"It occurred to us that the foregoing opinions of one so well known and so well posted upon the subject, might perhaps strengthen the faith of those who wish to see something even more than a certainty before they can believe. It did not in the least change our views, already believing as we do that sorghum is just as safe and vastly more profitable as a farm crop than corn."

THE "UNION" HAY-FORK.

We herewith illustrate a new hay-fork which, in its several details, is one of the most convenient and efficient ones we have ever seen. There are no springs about this fork, and it is certain to operate at all times, when it is properly used and taken care of. The principle involved is exceedingly simple and is akin to the toggle, or, as commonly called, the "elbow joint." The disconnecting arrangement, or that part which permits the fork to open so as to release the hay, is positive in its motion, and requires so slight an impulse to open both the forks, that a child is quite strong enough to perform the operation. The mechanical construction of the parts alluded to will be understood from the following description :—The shank of the fork, A, is all in one piece and is heart-shaped; to this shank the jaws, B, of the fork, C, are jointed so as to work easily. On the shank of this latter fork there is a link, D, which connects to the slotted handle, E, working on the center, F. This handle is not part of the shank of the fork, A, but is an entirely separate detail. There is also a tripping arm, G, attached to one side of the shank, working on the same center as the handle, E. This link, and the handle just mentioned, form a toggle joint, and their centers are all in line when the fork is loaded or closed, as shown in the engraving. When the tripping arm is pulled down slightly by the cord attached to it, the centers which join the link and handle are thrown out of line with each other and lets them open instantly to their full width, permitting the load to fall out, which it must do inevitably, because there is nothing to retain it. The movement of the tripping arm is very slight and is shown by the dotted lines, while the opening of the two forks is very large. The handle is merely for the purpose of inserting the forks into the load again, when the first is discharged. Should any part break, a common blacksmith can readily repair it; the hay is dropped from the fork upon the mow in the same way as by the hand fork, and always instantaneously, as explained previously; the fork also closes immediately afterward, and does not drag the hay off the rack in returning for another load. The double fork is also an advantage in holding the hay firmly so that it will not be scattered over the field or barn floor in loading and unloading. The fork itself, as thus arranged, is extremely light, and we recommend it as a useful and valuable addition to the already long list of mechanical assistants for farmers. The machine was invented by Rensselaer Reynolds and Charles Young, and a patent is now pending through the Scientific American Patent Agency, assigned in full to Rensselaer Reynolds, of Stockport, N. Y. For further information address the latter as above.



Coal Dust for Fuel.

In the coal mines of Charleroi, in Belgium, 800,000 tuns of coal dust have accumulated, impairing the working of the mines, and M. Dehaynin, Jr., and another company are working on this coal dust. After having it pulverized and freed of all strange matter, by machinery, this dust receives the forms and dimensions the best adapted for heating locomotives, by agglommerating eight parts of coal tar to ninety-two parts of coal dust. This mixture heated to 300 to 350 degrees, with superheated steam, becomes a paste, which is mechanically and powerfully pressed into cylindrical or retangular forms, and, after having been cooled, solid, compact cylinders, of about five inches diameter, and weighing eighteen pounds, or prismatic blocks of about five and a half by seven and twelve high, and weighing twenty pounds, are obtained. These blocks which are very nearly the same density and weight of the solid coal, and they burn without giving obstacle to the circulation of air through the grate. This new combustible is warranted not to give more than six per cent of ashes, and is now in great demand by railroad companies, on account of its greater heating power, and its being actually cheaper than the black coal. M. Dehaynin, Jr., and the other company manufacture now, annually, 255,000 tuns of this agglomerate.

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VOL. X. NO. 23....[NEW SERIES.]....*Twentieth Year.*

NEW YORK, SATURDAY, JUNE 4, 1864.

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THE SUPERHEATED THEORY TESTED BY EXPERIMENT.

The theory that boiler explosions are caused by the introduction of water into superheated steam was discussed on page 329 of our current volume, and we showed that the surplus heat in the steam would not be sufficient to evaporate enough water to fill its own volume with saturated steam, and thus to keep up the pressure—much less to increase it so greatly as to produce an explosion.

We are informed by Mr. Albert Hussey, the engineer at Hecker's mills, in this city, that two years ago he tried the experiment of injecting water into highly superheated steam, and that the effect was to reduce the pressure.

Meeting in some work the theory of boiler explosions discussed in our article on page 329, he saw that if it was sound he could arrange to inject water into superheated steam, and thus obtain a high pressure with a small consumption of fuel. He was running an engine that was supplied by three boilers, and he prepared for his experiment a small boiler, one foot in diameter and two feet long, having it well jacketed with felt. He then led a small pipe from the steam space of one of his large boilers, and passed it several times back and forth through his furnace so that it was bathed in the flame, and then conducted it to his small boiler. The pipe became red-hot, and the steam passed through more than fifty feet of this red-hot pipe before it entered the small boiler. Mr. Hussey connected a pressure gage with the small boiler and formed a pressure of 60 pounds to the inch—of course the same as the large boiler. He also attempted to measure the temperature, but the mercury in his thermometer was evaporated the instant he brought it in contact with the hot steam.

He now, by means of a small force pump, injected a minute quantity of cold water, through a pipe arranged for the purpose, into the small boiler, and the gage immediately fell about five pounds. He then arranged his connection with the pump so as to inject hot water from the large boiler into his experimental boiler, and the result was the same—the gage went down five pounds.

All sound theory must be founded on facts, and must of course agree with all other facts. Before we published our calculation of the effect which would be produced by injecting hot water into superheated steam, we were satisfied of its correctness, but it is gratifying to find it confirmed by an experiment to direct and conclusive as that of Mr. Hussey's. The theory of boiler explosions from the mixing of water with superheated steam may be regarded as settled.

CHEAP TOOLS.

A low-priced tool is not always a cheap one, and it is better, as a general rule, to pay a fair price for a good article than to stock a shop with machines that require large annual investments for repairs. At the very time they are most wanted it is probable that some derangement renders them useless, and if not an annoyance in this respect they always have chronic defects from faulty arrangement, defective fitting of the important parts, and the inferior material used.

A good tool is well worth its price; but this is not to say that any value may be set upon one. One instance occurred to us the other day which showed that the cost of a machine is not always a test of its value. We passed a machine agency and had the curiosity to inquire what a small slide-rest engine lathe was sold for; the reply was $320. When we add that the shears were about four feet long, and the whole affair badly worn, the modesty of the dealer may be imagined; it certainly cannot be described. Another lathe, about eight feet long in the shears and capable of swinging 20 inches, was valued at only $850. The same machines, perfectly new, could be bought for $150 and $300, in ordinary times.

There are no better lathes, planing machines, etc., in the world, than those made by the best firms in this country. In point of convenience, durability, and even elegance, they surpass the best tools made abroad. In price they are incomparably lower. The English tools are excellent, as are also those made in Scotland, but they are much heavier and have not the same little extras in the way of expediting the work that our own have. The character of the work on our tools, in general, is very high; the leading screws of the lathes are accurately cut, the slide rests well fitted, the cone pulleys properly balanced and fitted to steel spindles. The bearings of the planer beds are wider and stronger than they used to be, and the uprights made much stiffer; this is also true of the cross-head carrying the tool post.

In no way can the economy of the machine shop be practiced better than in buying and making first-class tools and putting first-class men to work them.

DEPARTMENT OF AGRICULTURE.

On the 15th of May, 1862, the President of the United States approved an Act of Congress establishing a Department of Agriculture. The Act states that the designs and duties of the Department "shall be to acquire and to diffuse among the people of the United States useful information on subjects connected with agriculture in the most general and comprehensive sense of that word, and to procure, propagate, and distribute among the people new and valuable seeds and plants."

Isaac Newton, Esq., was appointed Commissioner of Agriculture, under this law, and his report for 1862—the first yet printed—is now before us. It is a volume of 632 pages, 120,000 copies of which were directed to be printed by a resolution of the House of Representatives adopted March 3d, 1863—14 months ago. Public printing, like everything else undertaken by Government, is done in a very slow and clumsy way. This is the case with all governments.

This volume is filled with very valuable matter for farmers and all agriculturists. It supersedes the usual agricultural reports of the Commissioner of Patents, and, like those reports, it is mostly made up of articles on various subjects by writers scattered over the country. We shall publish copious extracts as fast as we can make room for them, and would suggest to such of our subscribers as are interested in agriculture to apply to their representative in Congress for a copy of the book. All members have a large number at their disposal and the privilege of franking them through the mails, and it is proper for any person desiring a copy that he should write to the Member of Congress from his district for one.

ONE of our English exchanges received recently contained the following announcement:—"Anthony Trollope, Esq., lately delivered a lecture to the *common people* of this town," etc. The "common people" were working-men. We suppose the lecturer was one of the uncommon order.

THE ROGERS' LOCOMOTIVE WORKS.

We made a flying trip to Paterson, N. J., last week, and improved the opportunity while there to go through the celebrated shops of the "Rogers' locomotive and machine works," whose engines for the last twenty years have been sent to all quarters of the globe. The beauty, efficiency and economy of them are so well known that it is needless to dilate here upon these qualities, and we shall only remark upon a few salient points that struck us in making our rounds.

The professional observer is at once impressed with the good quality of the work done. We took the liberty to scrutinize the most important parts very closely, especially the holes in the frames where parts were bolted on, the fittings of the slide bars, the valve faces, the proportions of the steam ports, the bore of the cylinders, as well also the material of which these several parts were constructed, and as we remarked previously, no laudation on our part can improve or alter the character of them—they are first class. The bolt holes are rimmed and the bolts carefully fitted, so tight as to require a two handed hammer to drive them in, and by a new method of construction some of the frames are welded where previously they were held only by bolts. In its general features the locomotive of to-day differs but little from that made five years ago. We say this advisedly, in its *general* features, but there are many details which although small in themselves, go far in the aggregate to enhance the value of the locomotive as a piece of mechanism. Of these minor features the Rogers' locomotive has a great many; doubtless those built in the other Paterson shops—Messrs. Danforth, Cooke & Co., and the New Jersey Locomotive Works—are equally well fitted, but we speak only of what we saw, and had our engagements permitted, we should have been pleased to go through the works just mentioned.

Mr. W. S. Hudson, superintendent of the Rogers' Works, went up in the cab of a new engine with us, and pointed out some of the fixtures we have touched upon; one of which was an arrangement of the handle communicating with the cock or the pipe which leads from the feed-pump to the tender tank. This was placed close by the gages so that without turning to the rear, as in old engines, the fireman or engineer could regulate the feed to a nicety. The safety valves were also attached to a simple apparatus in such a manner that by shifting a notched rod the pressure could be taken off the spring balances in a moment. When coming up to a station it is necessary to ease up the balances and this is generally done by slacking off the nut upon them, which is not only tedious but an injudicious plan, by the use of the arrangement mentioned a great deal of labor is saved. The door forward, which the engineer looks out of, had also a simple attachment consisting of a short iron bar fastened to it; said bar working through a slotted bolt-head fixed in the framing close by in such a way that when the door was opened and set at any point, a thumb-screw would hold the bar immovable, and the door could neither rattle or slam to and fro. The blow-cocks on the cylinder were also controlled by a handle in the cab, conveniently within reach.

The Gifford injector is fitted to the engines built in these works, but not as a principal feeder of water to the boiler. The main reliance is upon the old plunger pump, and the injector is only an auxiliary to be used when standing still. Some curious facts in relation to the use of the injector on engines running in Cuba were related to us. It was stated that the water was so bad in many parts of the island that the nozzle of the injector and the working parts, so to speak, or those through which the water passed, were literally cut out as if by mechanical action. The deposit from the water was also so injurious to the boiler, that one seldom lasted longer than four years, and some engines ten years old had been furnished with three boilers in that time.

The finishing shops of the Rogers' Works occupy a great deal of ground, and as we passed through them every lathe and planer was in operation. The force at the present time is very large, and the contracts under way heavy. The drivers are forced on the main axles by hydraulic pressure, and are then turned outside as usual; one end of the axle runs on its own bearing, while the other rests on the live center of the lathe. In this way the wheel may be

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turned outside on the rim, and cut off on the face of the hub by a slide rest fitted up for that purpose at the same time. There is a narrow and shallow groove turned out of the cast-iron face of the wheel, so that the tire has no bearing on that part. No bearing is necessary, for in running the engine a short time a peculiar action takes place which would render any contact there useless. The peculiarity is this—the tire draws away from the wheel or is hollowed up, so to speak, by the continual concussion and jar it receives. Every tire stretches by use so much that in time it becomes loose and must be renewed, but this appearance is quite distinct from stretching, and is very singular in character. Both wheels are turned on the tires at once. The boilers of the locomotives built at these works are made of the best iron and put together in a superior manner. Where the sheets lap they are strengthened *inside* by iron plates, which butt against the square edge of the sheet and are double riveted with the same rivets that hold the main sheets, thus making the joint actually the strongest part of the circle. The iron which is flanged is bent and warped a good deal in the process, but no attention is paid to this, and the sheet, crooked as it is, after the flanges are bent, is put into another furnace, annealed and then strengthened gradually and carefully, so that no fractures at the joints or corners is likely to occur.

Many engines for the Government are now building here—all of the wood-burning class. Some tank locomotives have been built of late years, but not in large numbers. Tank engines are those which carry their water on their backs (somewhat like camels), and have no tenders behind. For many purposes, such as switching trains or running on short lines of road, they are both economical and convenient, but with some plans of engines it is extremely difficult to adjust the weight of the tank and its contents properly; the consequence is that the engine is unstable or "uneasy" on the rails, and requires frequent repair. The cylinders of the engines now building in the Rogers' Works, run from twelve to sixteen inches in diameter. Occasionally some have been built as large as eighteen inches, but these are rare. Cylinders of twelve inches diameter and twenty-four inches stroke are quite common, and it would seem that the days of heavy engines with sixteen and eighteen-inch cylinders, except for special freight service, had passed away. We are indebted to the personal attention of Mr. W. S. Hudson for our information. Mr. Hudson is an accomplished mechanic and has made many improvements in the locomotive engines of late years, and we took great pleasure in the practical and sensible criticisms he passed upon certain methods of doing work. This discursive account presents but a very faint idea of the extent and capacity of the Rogers' Works; as regards the latter quality, two locomotives a week is the average, but this month they will exceed that number greatly; 750 men are now employed.

THE VALUE OF PATENTED INVENTIONS.

There are a class of minds in all communities that affect to despise or under-rate the value of inventions, and declare with emphasis that not one patent in a hundred is worth the parchment upon which it is engrossed. This view is entirely erroneous, and only shows that those who speak thus at random are wholly ignorant of the practical bearing of the subject. We commend to all such doubters the following remarks, upon this point, of Commissioner Holloway. He says that:—

"In this country, in consequence of the protection which the patent laws afford, the inventors have found a ready sale of good inventions to capitalists and manufacturers who possessed the capital required to put the inventions into practical form. It is to those manufacturers that the introduction of the seeding, harvesting, and mowing machines, thrashers, cultivators, etc., is immediately due. With a single eye to commercial results, they sent their agents through the rich agricultural districts, principally of the West, to exhibit the new machines and teach their operation. The agents convinced the farmers that the saving in the gathering of one year's crop would reimburse the cost of the machines, and readily made sales upon the understanding that the notes given in payment for the purchase should be paid out of the proceeds of the crop gathered by their use. The unparalleled rapidity with which the labor-saving machinery of the farm has been introduced throughout the West, in contrast with the proverbial slowness of the farmers of former times in adopting new improvements, must be attributed to the system I have just described.

"We can hardly over-estimate the benefit which the country has derived from these inventions, whose origin and introduction can be so clearly traced to the stimulus and protection by patents.

"It is stated by Mr. Kennedy, in the census report for 1860, that a thrashing-machine in Ohio, worked by three men, with some assistance from the farm hands, did the work of seventy flails; and that thirty steam thrashers only were required to prepare for market the wheat crop of two counties in Ohio, which would have required the labor of forty thousand men. It is estimated that a single reaping machine effects the saving of the labor of five men. With a good reaping machine ten men will cut, bind, and stack and house from ten to twelve acres per day, or two hundred acres in a single season—a task which would have required, without machines, the labor of fifteen men for its accomplishment. From reliable returns, in possession of this office, it is shown that forty thousand reapers have been manufactured and sold within the last year; and it is estimated by the manufacturers that over ninety thousand will be required to meet the demand for the next year. They will effect the saving of the labor of 450,000 men. The quantity of wheat grown in all the States and Territories in the year 1849 was 100,485,944 bushels. The quantity grown in 1859 was 171,183,381 bushels—an increase of nearly seventy per cent., or about double the increase of population in the same period.

Monitors Under Fire at Fort Sumter.

The monitors have been under fire again at Fort Sumter; the rebels have recently mounted fourteen mortars and four heavy guns, and it was desirable to destroy their preparations for offense. It is stated there is a Blakely fifteen-inch gun mounted there, but this is a matter of some doubt. At all events our fifteen inch guns were not idle and on striking the wall which remained standing-made holes as large as the turrets themselves.

The correspondent of the *Tribune* says that he had formed a poor opinion of their merits in regard to accuracy and rapidity of firing, but that during this attack they proved themselves extremely formidable. The rebel batteries opened upon the monitors but our vessels paid no attention to them whatever. The shot had no effect upon them.

New Method of planting Torpedoes.

The rebels have a new method of planting torpedoes in rivers without exposing their persons. They fasten the machines to a barrel containing clock work and a small anchor. The torpedo, clock work, and anchor are so connected that at a certain time the machinery will let the anchor go and moor the infernal machine at any point. The torpedo is dropped in the stream some distance above its final locality and the sower of these infernal seeds has only to calculate the time it takes to reach the desired spot to insure the proper and safe delivery of it.

AMONG the novelties in the Mechanics' Hall at the Pittsburgh Sanitary Fair will be a steam horse lately invented by a citizen of Pittsburgh. This horse is represented to be capable of supplying the place of the genuine quadraped, hauling drays, wagons, etc., and will adapt itself to all variations of road surface. This is a traction engine probably.

At Burt's Armory, in Windsor Locks, Conn., a steel chip was recently turned from a gun-barrel, of English steel, that measured in the "crook" two hundred and fifty-seven feet, and when straightened three hundred and forty-two feet, which is without a parallel in the history of steel turning.

IRON BECOMING HOT BY STRETCHING.—In a recent discussion in England on testing chain cables, Mr. Gladstone stated that he had had much experience in the matter, and had observed that when the iron begins to stretch the temperature rises, becoming so hot before the link parts that the hand when brought in contact with it cannot bear the heat.

ISSUED FROM THE UNITED STATES PATENT-OFFICE
FOR THE WEEK ENDING MAY 24, 1864.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

42,824.—Knitting Machine Needle.—Walter Aiken, Franklin, N. H.:

I claim the improved knitting machine needle, as made with two projections, d e, extending in opposite directions from its shank, a, substantially as and for the purposes hereinbefore specified.

42,825.—Nailing Wooden Soles to Boots and Shoes.—Louis Alcan, Newport, Ky.:

I claim an improved manufacture of wooden soled boots and shoes, the mode of secret nailing the front, B b, to an undercut rebate, a, and crimping the lower edge, b, of the front upwardly over the nail heads, n, in the manner and for the purposes set forth.

I claim the mode herein described of secret nailing the heel piece, C c, to the undercut rebate, a, of the wooden sole, A.

42,826.—Washing Machine.—Oren Baldwin, Summitville, Iowa:

I claim, first, The rubber or pounder, C, made hollow-mounted on rollers, d d, and constructed with inclined washing or pounding surfaces, c c', in combination with the inclined ends, B B', and detachable guides, g g, all in the manner and for the purpose herein described.

Second, The arrangement of the lever, D, hinged arm, h, dasher or pounder, C d, and devices, a' k, substantially in the manner and for the purpose described.

Third, The combination of vibrating lever, D, hinged arm, h, dasher, C, rollers, d d, and guides, g g, substantially as and for the purposes described.

42,827.—Device for holding Bits and other Tools.—Wm. Henry Barber, Greenfield, Mass.:

I claim the shape of the grasping jaws, B B, and the pressing of the bit into the socket by means of the longitudinal motion of said jaws, constructed, arranged and operating substantially as set forth.

42,828.—Combined Beer Faucet and Vent.—T. G. Berkel, Buffalo, N. Y.:

I claim, first, Making the piston valve, C, of such length as to allow it to be raised vertically a sufficient distance to operate the plunger, E, in a manner to suck up a quantity of liquor from the glass or cup into which it has been drawn, into the cylinder in which the plunger works, and to force it out again into the glass or cup, without uncovering the bore of the stem which leads into the cask in combination with said plunger and cylinder in which it works, for the purposes and substantially as described.

Second, In locating the vent opening in the top of the piston cylinder, B, of the faucet in combination with a valve, L, which valve is connected with the piston-rod and which is opened by the upward movement and closed by the downward movement of the piston-rod, substantially as set forth.

42,829.—Mode of adjusting Rings and Ring-rails in Ring and Traveler Spinning Frames.—John Birkenhead, Ilion, N. Y.:

I claim, first, The employment of the eccentric ring, g, as and for the purpose herein described and set forth.

Second, The combination of the gib, j, and bush, d, substantially in the manner as and for the purpose herein set forth.

42,830.—Wagon.—S. R. Bolton, Prescott, Wis.:

I claim the combination of the curved spring, D, friction roller, b, semi-circular bearing plate, c, and adjustable stirrup, F, all applied and operating in connection with the axle, E, hounds and tongue, B, as and for the purpose shown and described.

[The object of this invention is a device capable of raising and sustaining the draught pole or tongue of a vehicle in any desired position, so as to relieve the draught animals of the weight of said tongue.]

42,831.—Fire-pot for Stoves.—N. Oscar Bond, Needham, Mass.:

As a new article of manufacture I claim the improved fire-pot herein before described, the said fire-pot consisting of the cast-iron flanged cylinder, G H H', sheet-iron casing, I, inlets, h', and outlet, K, all as represented.

[This invention consists in a fire-pot which is principally applicable to what are known as base heating stoves, or those in which the products of combustion are carried down through driving or descending flues, so as to radiate heat at the lower part of the stove. This fire-pot is much more durable than those in common use and greatly increases the heating capacity of the stove.]

42,832.—Tire for Vehicles.—Alfred Brady, New York City:

I claim the making, useing, and constructing rims or tire for wheels with a combination of surfaces of different diameters having the surfaces of a number of plane surfaces or of plane and convex surfaces combined, as set forth and described in the foregoing specification.

42,833.—Stove.—Moses Bratt, Maysville, Ky.:

I claim, first, The gas-receiving chamber, F, provided with one or more apertures, c, in its bottom, b, in combination with the air-pipes, G, partition, H, and tube, I, substantially as and for the purpose herein set forth.

Second, The heat-radiating chamber, J, placed within the body, A, of the stove above the partition, H, and communicating with the external air as shown, when said chamber is used in connection with the gas-chamber, F, and pipe, I, and all arranged substantially as and for the purpose specified.

[This invention consists in placing a gas-receiving chamber within the stove or furnace directly over the fire chamber, said gas-receiving chamber having a concave bottom and perforated with one or more holes and using in connection with the gas-chamber a series of cold-air tubes, all being arranged in such a manner that the inflammable gases will be consumed and also the smoke. The invention further consists in using in connection with the gas-receiving chamber a heat-radiator and draught-deflector, arranged in such a manner that the heat from the fire and gas chambers will not be allowed to escape up into the flue, but will be radiated into the room or apartment in which the stove or furnace is placed.]

42,834.—Bat for Cricket, &c.—Philip Caminoni, New York City:

I claim the employment or use of the frame, A, provided at its un-

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der edge with a swell, C, and covered with a head, B, similar to a drum-head, substantially in the manner specified to serve as a substitute for the ordinary bat used in cricket and other similar plays.

[This invention consists in the employment or use of a circular oval or polygonal frame, covered by a piece of parchment, or skin of an ass, swine, or other animal, and bulged out at its lower edge in such a manner that it affords a convenient hold for the hand and a simple, durable and effective substitute is produced for the ordinary bat used in cricket and other similar plays. Mr. Caminoni's address is 117 Broadway.]

42,835.—Railroad Car Coupling.—Ralph Carkhuff, Lewisburg, Pa.:

I claim in a car coupling, the use and combination of the rack, G, pinion, H, and key, F, for the purpose set forth.

42,836.—Skiving Machine.—John W. & Charles F. Chase, North Weare, N. H.:

We claim, first, The friction roller, O, in combination with the inflexible frame, P, and spring-apron, M, substantially as set forth.

Second, We claim the use of the above described collared screw for adjusting the spring-apron.

Third, We claim supporting the gear shaft, G, upon the same posts or standards, B, which support and guide the gage roller, L, substantially in the manner and for the purpose set forth.

42,837.—Stove.—Richard Chester, Chicago, Ill.:

I claim, first, The arrangement of the partition, E, in the fire-pot, A, when constructed and operating substantially as and for the purposes set forth.

Second, The combination and arrangement of the partition, E, the front pipes, a, the chamber, B, the return pipes, b, the passage, x, and the circular pipes, c and e, when constructed and operating substantially as set forth.

Third, The combination and arrangement of the damper, i, the chamber, B, the pipe, h, the fire-pot, c, and the partition, E, when all arranged and operating substantially as herein delineated and described.

42,838.—Plow.—George B. Clarke, Leonardsville, N. Y.:

I claim the vibrating lever, K, working under the plow beam to remove the stalks, straw, or other obstructions from before the plow.

And in combination with the lever, K, I claim the link, M, and arm, G, to operate the lever, K, substantially as described.

I also claim the traversing bar, I, for the purpose of pushing the stalks, straw and other obstructions into the sweep of the lever, K, or from before the plow.

42,839.—Lantern and Lamp Frame.—George F. J. Colburn, Newark, N. J.:

I claim, first, The lantern and lamp frame, A, so constructed and arranged as to allow either a lamp or a candlestick to be suspended therein, substantially in the manner and for the purposes set forth.

Second, I claim the whole lantern in all its parts as combined, constructed and arranged, and fully set forth and described in this my specification.

Third, I claim the lamp Fig. 2, and the candlestick, constructed and connected with the lantern, substantially in the manner set forth.

42,840.—Electrical Apparatus for Lighting Gas.—Robert Cornelius, Philadelphia, Pa.:

I claim, first, The sliding packing box, d d, arranged and operating substantially as described.

Second, The use of one or more rings or recesses filled with shellac combined with the hard rubber neck of the electrophorus or the hard rubber support of the wire at the burner, substantially as above described.

42,841.—Mode of Clarifying and Condensing the Juices of Fruits.—Christopher Cory, Lima, Ind.:

I claim the manufacturing of cider and other similar fluids into sirups and jellies for domestic and foreign uses, substantially in the manner specified.

42,842.—Electro-magnetic Telegraph.—Samuel F. Day, Ballston Spa, N. Y.:

I claim combining with an indenting telegraphic registering instrument, a magnet constructed according to the proportions described in the foregoing specification, or substantially so, so as to accomplish the result stated by means substantially the same; that is to say, so as to give sufficiency of intensity and power of action to produce uniformly legible indentations in the paper, in an ordinary line current, without the aid of a local battery, as herein above set forth.

42,843.—Microscope.—John Ellis, New York City:

I claim, first, The chamber, I, formed by means of the glass, E, in the outer case, and the glass, G, in the inner case arranged and operating as specified.

Second, I claim the band, B, in combination with the openings, C C, for the purpose herein set forth.

42,844.—Process of refining and softening Lead.—Alexander H. Everett, New York City:

I claim the method herein described of refining and softening lead by the employment in reverberatory furnaces, and in combination with the melted lead-of-sulphur or metallic sulphurets, in the manner and for the purposes set forth.

I also claim the method herein described of refining and softening lead by the employment of hydro-carbon in combination with sulphur, in the manner set forth and for the purpose of preventing the oxidation of the lead.

42,845.—Mode of securing Shoes to Horses Feet.—Joel Fenn, Plainville, Conn.:

I claim a horse-shoe provided with a flange, a, to fit snugly against the exterior of the hoof, in combination with the metallic strap, B, and the front inclined portion of the part, d, on which the hoof rests, all constructed and arranged substantially as and for the purpose herein set forth.

[This invention consists in securing the shoe to the foot by means of a metal strap attached to each side of the shoe and extending over the hoof, whereby the use of nails is entirely avoided and the shoe rendered capable of being applied to and detached from the hoof with the greatest facility.]

42,846.—Welt and Thread Cutter for Sewing Machines.—Hannibal Folsom, Milford, Mass.:

I claim the arrangement of a welt-cutter or knife to operate above the plate, a, in conjunction with the thread knife to cut the thread below said plate, in the manner substantially as set forth.

Also the application of the knife so as to lie within the gage or lever, as shown, excepting when projected therefrom, as and for the purpose described.

Also the manner of applying the welt guide or holder by the hinge or its equivalent, substantially as specified.

Also the combination of the spring, i, arms, c f, and screw, h, for operating the edge guide, e.

42,847.—Hemp Brake.—John T. Gillman, Walnut Fork, Iowa:

I claim the adjustable cross-rail, I, secured to inclined arms, J, in combination with two sets of rapidly revolving beaters, D D, constructed and operating as and for the purpose shown and described.

[This invention relates to an improvement in that class of hemp brakes in which a series of revolving beaters are employed, which, by their action on the hemp, break the same and clean the fibre perfectly from the wood and other impurities.]

42,848.—Construction of Fence.—C. S. S. Griffing, Ashtabula, Ohio:

I claim, first, The clasps, D E F, thimble, G, brace, J J', and sleeve, K, the several parts being constructed, arranged and operating as and for the purpose set forth.

Second, I claim the adjusting brace, J J', and sleeve, K, when constructed and operating as described.

42,849.—Portable Field-fence.—C. S. S. Griffing, Ashtabula, Ohio:

I claim the special arrangement of the base, C, the standards, D D', braces, E E', pins, F and b, and block, c, in combination with the panels, A A A A B, the several parts being constructed and arranged as and for the purpose herein set forth.

42,850.—Submerged Track for Canal Propulsion.—E. C. Harrington, Boston, Mass. Ante-dated May 18, 1864:

I claim, first, The employment of tractor wheels to act in combination with submerged rails, or tracks, substantially as and for the purpose described.

Second, Constructing submerged rails, or tracks, with teeth, or racks, to operate in combination with cogs on the peripheries of submerged tractor wheels, for the purpose of propelling boats, substantially as described.

Third, Rendering the tractor wheels vertically self-adjusting by fixing their axles in blocks, D D, or their equivalents, sliding in the grooves, or guides, E E, attached to the outside of the boat, substantially as described.

42,851.—Churn Body.—J. C. Hills, Willoughby, Ohio:

I claim the herein-described construction of a churn body, consisting of the sides, A A, plate A', groove, B B', bars, C C' and E, when arranged and secured in the manner and for the purpose specified.

42,852.—Trace Hook.—Alvin Hodgdon Lowell, Mass.:

I claim the improvement in the spring, D, for cheapness, convenience and safety, in combination with the hook, B, or snibal, C, to prevent accident, by detaching instantly an ungovernable or affrighted animal from the carriage.

42,853.—Railroad Lamp.—Lewis Hover, Chicago, Ill.:

I claim, first, The combination of the shaft, a, with the adjustable shaft, b, constructed, arranged and operating substantially as and for the purposes specified and shown.

Second, I claim, in combination with the adjustable shaft, b, the employment of the spring, d, arranged and operating substantially as and for the purposes shown and described.

Third, I claim the employment of the arm, e, in combination with the shafts, a and b, as and for the purposes shown and set forth.

42,854.—Jacket Stretcher for Couch Rollers of Paper-machines.—Robert L. Howe, Westbrook, Maine:

I claim the said couch roller jacket stretcher, or combination of the screw, D, the bevelled disc, E, and the bevelled annulus, F, constructed and arranged substantially in manner and so as to operate as and for the purpose herein-before specified.

42,855.—Shears for Sheet Metal.—L. T. Hulbert, Painesville, Ohio:

I claim, first, The vibrating shaft, E, provided with the broad curved surface, formed as described and for the purposes specified.

Second, I claim the arm, K, attached to the vibrating shaft, E, as above described, and carrying or supporting the adjustable gauge, L, as and for the purposes set forth.

Third, I claim supporting the shaft, E, constructed as described, on the slotted adjustable supports, D D, and operating it by means of the lever-arms, H H, connecting-rods, I I, and the foot-lever, arranged in the manner described and for the purposes specified.

Fourth, I claim the compensating screws, U U, in combination with the shaft, E, constructed as and for the purpose set forth.

42,856.—Lantern.—John H. Irwin, Chicago, Ill. Antedated Feb. 27, 1864:

I claim, first, The deflector, a, when constructed and arranged substantially as and for the purposes herein set forth.

Second, The combination and arrangement of the deflector, a, the oil-cup, and the apertures, b, all constructed and arranged substantially as set forth.

Third, The deflector, a, the oil-cup, and the side openings, c c, when constructed substantially as and for the purposes set forth.

42,857.—Horse Shoe.—John M. Johnson, Washington, D. C.:

I claim attaching horse shoes by means of two, three or more clips or arms, B, secured to the shoes in any manner, substantially as herein described, and fastened to the hoof by one, two or more screws, C, as set forth.

[This invention relates to a novel manner of securing shoes to the hoofs of horses, which causes no injury or violence to the hoof, admits of the shoes being readily attached or detached by any person having charge of the animals, and which, while constituting a more secure fastening, greatly lessens the expense, time and labor involved in attaching the shoes by the ordinary nails.]

42,858.—Chair-seats and Sofa-bottoms.—J. W. Kimball, Boston, Mass., and J. Mahady, Cambridge, Mass.:

We claim the employment of the edge-piece or strip for an upholstered article, substantially as described.

42,859.—School-desk and Seat.—R. Cruikshank, Pottstown, Penn.:

I claim the combination with a school-desk of a hinged seat, supported by curved bars, either in a horizontal or a vertical position, when arranged and operating substantially in the manner described for the purpose set forth.

42,860.—Tag for Cotton-bales.—Edward A. Locke, Boston, Mass.:

I claim constructing a flexible anchoring tag with a shank or elongation for entering the bale, integral with or forming part of the tag, substantially as set forth.

I also claim constructing the tag when so made of material possessing sufficient rigidity and strength to enable it to properly retain embossed letters or other characters, while also possessing pliability and tenacity such as will admit of its being crimpled or bent without breakage or injury.

I also claim constructing the hook or anchor of material which is incapable of emitting or producing sparks by contact with machinery or foreign substances as set forth.

42,861.—Machine for Winding Conical Bobbins.—Henry Marcellus, and Sam. Ward, Amsterdam, N. Y.:

We claim the arrangement of a conical roller, A, in combination with a conical bobbin arranged with its axis horizontal or nearly so, and pressed endwise toward or against the conical roller with a yielding force, by the action of the belt, F, by which the bobbin is revolved, substantially as herein described.

42,862.—Railroad Dumping-cars.—Thomas A. M'Farland, Meadville, Pa.:

I claim the moveable dirt-box, A A, the revolving drums, M and N, the levers, G and F, the ropes, P and Q, and pulleys, 1 2, when the same are constructed as described, and in the aforesaid combination for the purposes set forth.

42,863.—Machine for Boring Angular Holes.—Benjamin Merritt, Jr., Newton, Mass.:

I claim, first, Cutting or boring holes, of any sectional area desired, by means of rotary cutters reciprocating to and from their axes of rotation substantially as set forth.

Second, Combining with the expansible rotary cutters a fixed pattern cam, actuating the said cutters to reciprocate in their rotary travel, substantially in the manner and for the purpose set forth.

Third, The combination with the reciprocating rotary cutters, and cam, as described, of fixed rotary cutters to cut the bulk of the wood, or other material, out of a circle inscribed in the area of the hole to be cut.

Fourth, The arrangement in the axis of the cutter-head, and in combination with the reciprocating rotary cutters of a screw-tug.

Fifth, The combination of racks with the rotary cutters, and operating the same by means of a pinion on the end of a shaft, which in its turn is rotated back and forth by means of a rack gearing with a pinion on the same shaft, as set forth.

Sixth, In combination with the reciprocating rotary cutters, operated as described, I claim the revolving hollow shaft enclosing the pinion shaft, the said hollow shaft carrying in a suitable slide-box, or bearing, the rack which operates the pinion shaft, as set forth.

Seventh, The arrangement, in combination with the hollow main shaft, pinion shaft and its operating rack, of the stationary cam, so that, on rotary motion being imparted to the hollow shaft, the rack shall both be rotated with it, and reciprocated in accordance with the conformation of the cam.

Eighth, I claim the general combination and arrangement of the machine or apparatus for cutting square or other regular or irregular shaped holes, substantially as herein described.

42,864.—Stump-puller.—F. M. Morgan, Huntington, Ind.:

I claim the blocks, I J K, arranged in combination with the root-chain, L, rope, H, double-cone drum, E, and pulleys, O N, substantially as and for the purpose herein shown and described.

Also the curved flange, i, in combination with the pulleys, O N, draught rope, M, drum, E, and blocks, I J K, constructed and operating in the manner and for the purpose substantially as herein specified.

[This invention relates to certain improvements in that class of stump-pullers in which the power of the draught animals is multiplied by means of pulley blocks, drums and sheaves of various diameters.]

42,865.—Dinner Can.—John H. Murphy, Boston, Mass.:

I claim the combination of the lamp chamber, constructed as shown, with vertical passages in its walls or sides with the vessels, A, and D', fitted thereto, substantially as above described.

42,866.—Manufacture of Paper from Spanish Grass.—W. B. Newbery, Dorchester, Mass.:

I claim the within-described process of manufacturing paper from esparto (*stipa tenacissima*) or Spanish grass, either alone or in combination with manilla, jute, gunny or other fibrous material, substantially as set forth.

42,867.—Fire-shovel.—F. J. Niemöller, Rich-fountain, Mo.:

First, I claim the shovel, A, provided with a channel, b, in its bottom in combination with the hollow handle, B, and plunger, C, constructed and operating in the manner and for the purpose substantially as herein shown and described.

Second, The application of the lifter, c f, to the front edge of the cover, E, of the shovel, substantially as and for the purpose specified.

Third, The application of the hook or poker, d, to the piston rod, D, as and for the purpose set forth.

[This is a very ingenious and useful invention.]

42,868.—Machine for washing and scouring Vegetables.—Frederick Nishwitz, Brooklyn, N. Y.:

I claim a rotating vegetable receptacle, provided with one or more spiral partitions, C C', arranged relatively with openings, c c', in the heads, a a', of the receptacle, to operate substantially in the manner as and for the purpose herein set forth.

I also claim having the inner surface of the case or periphery of the vegetable receptacle corrugated or roughened either with or without a corrugated or roughened surface on the spiral partition plates, C C', for the purpose specified.

I further claim, in combination with a rotating vegetable receptacle, the employment or use of one or more balls or spheres having a corrugated or roughened exterior, to operate as and for the purpose set forth.

[This invention consists in placing within a rotating vegetable receptacle one or more spiral partitions, the ends of the vegetable receptacle having openings made in it which are so placed relatively with the spiral partitions, that when the receptacle is rotated in one direction the vegetables will be retained in it, and be thoroughly washed and scoured or cleaned, and when said receptacle is turned in the opposite direction the vegetables will be discharged.]

42,869.—Blasting Compound.—Moritz Nowak, Williamsburgh, N. Y. Patented in Austria March 28, 1863:

I claim the within-described composition of the ingredients above specified when mixed together in about the proportion set forth, and applied to paper, textible fabrics, cotton waste, sawdust or other vegetable materials, substantially in the manner and for the purpose described.

[This invention consists in the application to vegetable materials of any description, such as leaves from trees, sawdust or waste cotton, of a composition of binoxide of manganese or carbon, chlorate of potash, nitrate of potash, and ferrocyanide of potassium, mixed with a small quantity of starch and of chromate of potash, in such a manner that after said vegetable materials are fully impregnated with the above named composition, they can be formed into suitable packages or cartridges, protected by water-proof paint, and used for blasting purposes below or above the surface of the water.]

42,870.—Propeller.—Grenville Parker, Worcester, Mass.:

First, I claim the paddles or buckets to my wheel, hereinbefore described.

Second, I claim the position of my wheel hereinbefore described, in an open channel, as before described, which shall extend from the stern forward any part of the boat's length.

42,871.—Grain Drill.—W. P. Penn, Bellville, Ill.:

I claim the combination of the regulating valve or slide, a, the feed valve, c, the shut-off valve, g, and moderating valve, f, with each other and with the hopper box of a grain drill, substantially as described.

42,872.—Manufacture of Table Cutlery.—F. W. Presber & Philipp Shiebel, Winchester, Conn.:

We claim the mode of constructing and applying the bolster to table cutlery, as herein described or any other substantially the same.

42,873.—Steam Gage.—T. S. Ray, of Buffalo, N. Y.:

I claim, first, The coil spring, G, so arranged and placed as to pull upon the short end of the lever, D, for the purposes and substantially as described.

Second, Making the bearing piece, F, adjustable, in combination with the lever, D, and capsule, C, substantially as described.

Third, The adjustable push piece, M, in combination with the lever, D, spring, N, and segment, K K', for the purposes and substantially as described.

Fourth, The adjustable pin, O, in combination with the post, P, and segment, K, as set forth.

42,874.—Lifting Pump.—F. Raymond and A. Miller, Cleveland, Ohio:

I claim the chamber, C, cylinder, A, piston, I, pipe, E, curb, G, rack and pinion, L N, and diaphragm, H, the several parts being constructed, arranged and operated as and for the purpose set forth.

42,875.—Rail for Railroads.—Horace Resley, Cumberland, Md.:

I claim constructing rails for railroads, substantially in the manner and for the purposes herein recited.

42,876.—Sewing Machine Guide.—Thos. Robjohn, Mott Haven, N. Y.:

I claim the combination with a folding guide, A, of a guide, B, constructed and arranged substantially as herein described for the purpose set forth.

[This invention consists in a novel combination of two guides one of which will fold and double a strip of muslin or other fabric along the center of its width and turn in both edges, while the other directs the edge of a fluted frill between the edges of the folded strip, to be sewn thereinto, and produce a band ruffle, as the strip and frill pass from the said guides under the needle of a sewing machine. It also consists in a novel construction of the guide by which the frill is conducted into the band.]

42,877.—Sewing-machine Guide.—Thos. Robjohn, Mott Haven, N. Y.:

First, I claim the guide, B, constructed and furnished with springs, f g, substantially as and for the purpose herein specified.

Second, The combination of the said guide, B, and its guides, f g, with the guide, A, substantially as herein described, for the production of a ruffle such as herein specified.

[This invention consists in the combination of a folding guide for doubling a strip of muslin or other material by folding it in a longitudinal direction, and a flat tubular guide for guiding a lace or other edging, whereby the said strip may be folded and the edging delivered in such relation to its folded edge at one operation, while both are on their way to the needle of a sewing machine, that the two may be stitched together.]

42,878.—Valve Gear for Steam Engines.—John B. Root, New York City:

I claim the sliding yoke, G, applied and operating in combination with the valve and valve chest, substantially as and for the purpose herein specified.

[This invention relates to slide valves, all portions of which have a similar circular movement about an axis perpendicular to the faces of the valve and seat, and is applicable both to the slide valves of ordinary reciprocating engines, and to a valve arrangement which consists in the employment for guiding the circularly-moving valve of a yoke within which the valve is permitted to move rectilinearly and which works between rectilinear guides in the valve chest at right

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angles to the movement of the valve within the yoke, whereby the valve is kept in proper relation to straight ports in its seat.]

42,879.—Shield for Camp-fires.—M. Saviers, Kansas City, Mo.:

I claim a guard or shield for camp fires composed of a sheet-metal plate, A, in connection with a rod, B, arranged substantially as herein set forth.

[This invention relates to a guard or shield for protecting camp fires from wind and rain, and also afford an efficient means for suspending kettles, meats, etc., over the fire, and to prevent smoke and fire being driven into the tent or camp, even when the device is placed in close proximity to the same.]

42,880.—Double Globe Lens.—Joseph Schnitzer, New York City:

I claim a lens composed of two or more pairs of segments, B B′, which are arranged on opposite sides of a diaphragm, C, in the case, A, substantially in the manner and for the purpose herein shown and described.

[This invention consists in a lens composed of two pairs of spherical segments arranged on opposite sides of a diaphragm in a cylindrical case, and placed together under a certain angle in such a manner that the axis of one pair of segments makes an angle of 60 degrees, more or less, with the axis of the other pair of segments, and that by inserting this lens in a photographic camera two pictures can be taken simultaneously of the opposite sides of a street or of different parts of a landscape, on glass or other material, placed in the proper position behind the lens.]

42,881.—Journal Box for Railroad Cars.—John O. Scott, New York City:

I claim the employment of a series of loose conical-ended rollers, E F, between grooved journals, B, and boxes, C, in the manner and for the purpose before stated and described.

42,882.—Mill Pick.—Thomas Sheehan, Dunkirk, N. Y.:

I claim, first, A hand mill pick, A B, adapted to thrust out the thin cutters, I I′, and to support the faces of the same close to the cutting edges, substantially in the manner and for the purposes herein set forth.

Second, I claim, in mill picks, the rack, D d, the locking screw, G, and pinion, c, or their respective equivalents, arranged relatively to the thin cutter, I, substantially as and for the purpose set forth.

42,883.—India-rubber Tablet.—F. M. Shepard, New York City:

As new articles of manufacture, I claim calendars made in tablet form with the letters or inscriptions embossed on or impressed in the material of which it is composed, in such manner that they shall be in relief or depressed, that is, project from or sunk below the general surface of the tablet, the letters being arranged in such manner as to form on one or both sides a calendar in a condensed form, giving the dates of every day and month of the year or years, substantially as set forth.

42,884.—Hold-back Iron for Carriages.—J. P. Simmons, Fulton, N. Y.:

I claim the construction and arrangement of the spring lever, C, consisting of the angular sides, b, coils, a, and ends, c, when the same is used in combination with an iron whose hold-back hook or horn is provided with the nib, g, the whole constituting a new article of manufacture, substantially as herein set forth.

42,885.—Railroad Chair.—E. St. John, Elmira, N. Y.:

I claim the combination with the sustaining bar, B, and bed-piece, C, of the clamp, E, all applied to each other and to the rails, A A′, and cross-ties, D, substantially as and for the purposes herein shown and described.

42,886.—Chamfering Machine.—James Stufflebeen, Milwaukie, Wis.:

I claim, first, The yielding knives, B B, as arranged, substantially as and for the purpose described.

Second, The splitting knife, D, in combination with the knives, B B, substantially as and for the purpose described.

Third, The adjustable spreader, C, in combination with the knives, B B, substantially as and for the purposes described.

42,887.—Churn.—William Tibbets, Lafayette, N. Y.:

I claim the plain and bifurcated beaters, a b, when arranged in a reversed spiral form, as described, in combination with the rectangular body, g g, wheels, i and l, the several parts being arranged and operating in the manner and for the purpose herein specified.

42,888.—Grate-bar for Furnaces.—J. Vandercar, Brooklyn, N. Y.:

I claim the combination in one casting of three or more parallel imperforated bars, A A A, tapering downward in thickness, each formed with a horizontal-grooved top and a convex lower edge; the solid heads, B B, connecting the said bars together at their ends; the alternating intermediate connections, a a a, and the lateral projections, c c c, both extending from the upper to the lower edges of the bars, all as herein specified.

[The object of this invention is to better prevent the warping of the bars both laterally and vertically and at the same time to provide effectually for draught and for the picking and raking of the fire from below, and to this end it consists in the combination in one casting of three or more single bars with intermediate lateral connections alternating with each other in position so as to break joint.]

42,889.—Horse-shoe.—Samuel Ward, Cambridge, Mass., and L. J. Munger, Charlestown, Mass.:

First, We claim attaching the heel calks in the manner and by the means substantially as described.

Second, Confining the toe calk in its mortise by means of the projecting portion, j, the bar, E, and the screws, g g, substantially as described.

Third, Constructing the inside of the heel calks with a concavity, m, to fit the head of the screw, i, substantially as set forth and for the purpose described.

Fourth, The flange, J, on the periphery of the shoe and forming an end to the mortises, f, substantially as and for the purpose described.

42,890.—Medicine.—R. B. Weese, Charlottsville, Ind.:

I claim a medicine consisting of the above ingredients, compounded in proportions, substantially as specified, as a specific, for the treatment of fits.

[This compound has been found by practice to constitute a most speedy and effectual remedy for fits, and the principal ingredients of which it is composed may be very readily obtained in many localities.]

42,891.—Water Engine.—Carlyle Whipple, of Detroit, Mich.:

I claim the flume, A, cylinders, C D, having openings, C′ D′, in combination with the walking-beam, F, and connecting rods, E, the several parts being constructed, arranged and operating as and for the purpose herein set forth.

42,892.—Straw-cutter.—John R. Whittemore, Chicopee Falls, Mass.:

I claim the combination of the rotary knives, D D D, and gears, H and I, with a pressure cylinder, against which the knives cut, having the pins, a a a, arranged so as to work intermediately between the knives, for the purpose of feeding the hay or straw to the knives substantially in the manner herein set forth.

42,893.—Stove.—Edward Wilbur, Albion, N. Y.:

I claim a compact series of large-surfaced, broad and shallow, non-inter-radiating, ascending and descending radiating flues, connected at the sides or angular edges, arranged concentrically or elliptically, so that the largest amount of radiating surface is in their front, the whole front of all the radiating flues being formed of one connected sheet of iron, and the back thereof being formed of sheet or cast-iron, in one or more pieces, substantially as shown and described.

42,894.—Mold for casting Screw Heads.—N. S. Williams, East Hampton, Conn.:

I claim, first, The central main runner, f, tapering in an upward direction in combination with the radiating branch runners, g g, and the concentric circularly-arranged series of molds, substantially as herein specified.

Second, The post, H, cross-head, F, and attached pins, I I, or their equivalents, in combination with the three plates B C D, for the purpose of raising the plates, D and C, one after the other, substantially as herein specified.

42,895.—Knapsack.—O. E. Woods, Philadelphia, Pa.:

I claim, first, The gun-holder, F, in combination with the blanket straps, B B, and the knapsack, A, operating substantially in the manner and for the purpose herein shown and described.

Second, The brace straps, K K, applied to and operating with the straps, B B, and the knapsack, substantially as herein shown and described.

Third, The construction of the sling strap, E′, so that it will couple and uncouple at the breast, substantially in the manner and for the purpose herein shown and described.

Fourth, The gun link, I, constructed and operating substantially as herein shown and described.

Fifth, The employment of the rings, G G′, in combination with the shoulder straps, as and for the purpose herein shown and described.

Sixth, The use of the hook, H, in connection with the strap, E′, and ring, G′, as set forth.

Seventh, The method herein described of counter-balancing the knapsack and the musket.

42,896.—Machine for making Paper, Twine, &c.—John B. Wortendyke, Goodwinville, N. J.:

I claim, first, The moistening of the strip of paper of which the twine is to be formed, while on its way to or between the rollers by which it is delivered to the spindle or throstle by which the twisting is performed, substantially as herein described.

Second, The employment in combination with means of moistening the strip of paper on its way to the spindle or throstle of a guide, E, or other equivalent device for gathering up the moistened strip edgewise or laterally into the form of roping, substantially as herein specified.

[The object of this invention is to effect the manufacture of twine of good quality from paper, by machinery substantially like that employed in spinning cotton and other fibrous materials.]

42,897.—Car Coupling.—Elias M. Wright, Wyandot, Kansas:

I claim the coupling, D, constructed, arranged and operating in combination with the nearly hemispherical cavities, b b, in the bumper heads, substantially as and for the purposes herein set forth.

42,898.—Treating and utilizing Oxides of Iron from Gas-purifiers.—W. Clelland, Liverpool, England:

I claim producing from oxides of iron that have been used for purifying gas, sulphide or sulphuret of iron, by heating the said oxides, substantially in the manner described.

42,899.—Manufacture of Iron.—William H. Dawes, West Bromwich, England. Patented in England, June 17, 1863:

I claim, first, Manufacturing wrought or malleable iron by puddling refined iron conveyed in a melted state from the refinery to the puddling furnace, the quantity of the melted refined iron operated upon at one time in each puddling furnace being only sufficient for the manufacture of one ball of wrought or malleable iron.

Second, Combining the blast furnace and refinery and puddling furnace used in the manufacture of iron substantially as herein described.

42,900.—Manufacture of Flexible and other Tubes, Hose, &c.—Isaac B. Harris, Castle Mills, Fountain Bridge, Edinburgh, Scotland. Patented in England, June 15, 1863:

I claim the causing of India-rubber composition tubes, when in combination with woven or other tubes, to be vulcanized, or to be converted into vulcanite, whilst subjected internally to the pressure of fluid, substantially as herein described.

I also claim the combination of mechanical parts, a b c d e f g h i j substantially as above described.

42,901.—Process of Treating Fatty Bodies for the Manufacture of Candles.—Hippolyte Mége, Paris, France:

I claim, first, The application of a perfect alkaline soap—a soap in which the fatty body is completely saponified, whatever may have been the process, for its being manufactured to simplify and improve the whole of the manufacture of stearic acid.

Second, The use of one soda-lye, the quickening of the carbonate of lime, the extracting the glycerine from the exhausted lyes.

Third, The reducing the fatty bodies to a complete globular state, before causing the lye to act the rapid saponification at a lukewarm temperature, and the performing the boiling or coction by the mere coagulation of the globules.

Fourth, 1. The decomposing of the soap by rapid and easy means, and the collecting the sulphate of soda to quicken the soda. 2. Using hydro-chloric acid, when the soap or a part of the soap has the lime for base, and the quickening that acid by decomposing the chloride of calcium by sulphuric acid.

Fifth, The employing of only one pressure at the ordinary temperature.

Sixth, The suppressing water washings, and the clarification of the stearic acid by one fusion only. The plunging that acid into cold water after the complete solidification.

Seventh, The employment of a solution of a hydro-chlorite and the atmospheric contact to discolor colored fatty bodies, and their distillation after being acted upon by a nitric compound, as herein before described.

42,902.—Enveloped Thread Clews.—L. M. F. Patureau, Paris, France:

As a new article of manufacture I claim thread or other yarn prepared for the market or trade into clews confined in capsules, made in two shells glued together by a strip or band of paper, one of said shells being provided with one or more holes, in the manner and for the purposes set forth.

42,903.—Wrench.—L. Schwartzkopff and E. Kaselowsky, Berlin, Prussia:

We claim the eccentric recess, d, or its equivalent, at the head of the handle, C, of a wrench, in combination with the toggle arms, e, and moveable jaw, B, constructed and operating in the manner and for the purpose substantially as shown and described.

[This invention consists in the arrangement of an eccentric recess at the head of a hinged handle of a wrench, in combination with toggle arms interposed between or connecting the head of the handle and the moveable jaw of the wrench in such a manner that by throwing the handle in one direction the wrench is opened, and by throwing the handle in the opposite direction the wrench closes, and gripes a nut or other article placed between the two jaws the more firmly the harder the pressure upon the handle, and the smaller the nut or other article to be turned by the action of the wrench.]

42,904.—Steam Generator.—Geo. True, Funchal, Island of Madeira:

I claim the within-described apparatus, consisting of the cylinders, B B′, force-pump, H′, retort, K, receiver, f, and chamber, L, in combination with a steam boiler, I, constructed and operating substantially as and for the purpose specified.

[The object of this invention is to combine with a boiler an apparatus capable of converting suitable substances, such as petroleum or other hydro-carbon liquids, into gas within the boiler, and burning the gas so formed at a pressure as high or higher than that of the steam, in such a manner that the heated products of combustion are forced through the water and caused to mingle with the steam, and thus the entire heat evolved, as nearly as may be, is usefully applied.]

42,905.—Wood Screw.—Jason A. Bidwell (assignor to himself, A. Churchill, H. T. Litchfield & Daniel M. Robertson), Boston, Mass.:

I claim, as a new article of manufacture, a wood screw with a stem of uniform size (except the tapering point) and made with a tapering point sharp edged thread and concave score, all as above described.

42,906.—Attachment of Lantern Guards.—Thos. Brown, Jr., Alleghany county, Pa., assignor to himself and James McLain, Pittsburgh, Pa.:

I claim the mode of attaching the globe or glass to the top and bottom pieces of the lantern without cement by means of the guard, substantially as herein-before described.

The use of a guard for lanterns, composed of a detached hoop and wires looped either to the top or bottom part of the lantern and secured to the other part by means of a series of pins on a slide or other equivalent device, constructed and arranged substantially as described.

The arrangement and combination of the notches in the lantern frame and notches and pins in the slide, in such a manner as to fasten the wires in succession.

42,907.—Stamping, &c., Metal.—Virgil Draper (assignor to Oscar M. Draper), North Attleboro', Mass.:

I claim the combination of the separate centering piece, a, with the punch, C, the die, b, and the mold plates, A B, or their mechanical equivalent, the whole being substantially as specified.

42,908.—Clothes Wringer.—Daniel D. Gitt, Arendtsville, Pa., assignor to the Metropolitan Washing Machine Company, Connecticut:

I claim, first, The method herein described of operating movable rolls of a wringing machine from fixed gears by coupling either or both of the axles of the latter with the corresponding shafts of the former by means of a flexible connection, substantially as set forth.

Second, The combination in wringing machines of a rotary driving mechanism set in fixed bearings with rolls, the axles of either or both of which are held in movable bearings, substantially as set forth.

Third, Combining in wringing machines with gear wheels rotating in fixed bearings and rolls rotating in movable bearings, a linked or flexible connection, substantially as set forth.

Fourth, The combination in wringing machines of a pair of rolls with fixed gear wheels when one of the rolls rotates in fixed bearings and is rigidly connected with its corresponding gear wheel while the other is rotating in movable bearings and is connected with its corresponding gear wheel by means of a flexible or link connection, substantially as set forth

Fifth, The construction of a frame of a wringing machine with a standard or standards for the gear mechanism, separate and independent from the standards of the rolls, substantially as set forth.

Sixth, Connecting in wringing machines the shaft of the driver of the gear wheels with the shaft of the corresponding roll by means of the universal joint, substantially as set forth.

42,909.—Animal Feeding Trough.—John N. Gray, Lynn, Mass., assignor to Daniel Sager, Albany, N. Y.:

I claim an animal feeding trough, so constructed and arranged as to permit of its being rotated in a vertical plane, substantially as described.

42,910.—Fabric for Roofing.—Jonathan H. Green, Christiansburg, Iowa, assignor to James B. Hodgskin, New York City:

I claim an article of manufacture for roofing or other similar purposes, formed by attaching water proof paper to one or both sides of canvas, or other suitable material, substantially as and for the purpose set forth.

42,911.—Carriage Axle.—Wm. T. Harrington (assignor to himself and Benjamin F. Anthony), Roxbury, Mass.:

I claim the improved axle, as made with the extra journal or extra arm and journal arranged with the primary journal and to operate or revolve on a center pin, in manner and under circumstances substantially as described.

42,912.—Cider Mill.—Horace Hurd (assignor to himself and J. E. Baldwin), Spring Hill, Ill.:

I claim the grater cylinder, B, having a surface or covering of punched sheet metal in combination with the punched feed plate, D, all arranged to be operated as herein described.

[This invention relates to an improvement in what is generally known as the "grater mill," for grinding apples in manufacturing cider. The object of the invention is to produce a mill of the kind specified which will perform its work much more rapidly and thoroughly than those hitherto constructed, and one which may be constructed at a much less cost.]

42,913.—Blasting Powder.—Frederick August Jaeckel, Buckau-Magdeburg, Prussia, assignor to Schaffer & Budenberg, New York City:

I claim a blasting powder consisting of nitrate of potash, nitrate of soda, sulphur, charcoal, mineral coal, and potassio tartrate of soda, and other equivalent vegetable or mineral substance, compounded substantially as herein described.

[The object of this invention is to produce a blasting powder which, when lighted in the open air, will give no explosion, but which will explode with great force when lighted in a closed space.]

42,914.—Boring Machine.—Samuel N. King, Windsor, Vt., assignor to the Lamson & Goodnow Manufacturing Company, Sherburne Falls, Mass.:

I claim the combination of the rack, I, guide, h, curved slot, j, and stud, i, when applied to a boring and drilling machine, and operated as herein described.

42,915.—Device for dyeing Felt Caps, &c.—John McFarlane, Mattawan, N. Y., assignor to John Falconer, New York City:

I claim the combination of the clamping pieces, A A b c d, and clamps, B B, when constructed and employed in the manner and for the purpose herein specified.

[The object of this invention is to exclude the dye from certain parts of any article, and obtain thereon, after the dyeing process, a figure or figures of the original color which the article had before the dyeing.]

42,916.—Sewing Machine for sewing on the Soles of Boots and Shoes.—Gordon McKay, Boston, Mass., and Lyman R. Blake, Quincy, Mass., assignors to Gordon McKay, Boston, Mass.:

We claim the construction of the tip of the horn, substantially as and for the purpose specified.

42,917.—Combined Sink Strainer and Stench Trap.—Henry F. Shaw, West Roxbury, Mass., assignor to himself and Wm. S. Locke, Boston, Mass.:

I claim the cup, C, provided with the oblique perforations, d, to operate both as a stench trap and strainer, substantially as described.

42,918.—Farriers' Tool.—E. Warren & Wm. Johnston (assignors to E. Warren), Marshall, Mich.:

We claim, as a new article of manufacture, the combined nippers, clinching tool, rasp, and punch, constructed in the manner herein represented and described.

[This invention consists in combining with a nippers and clinching device a rasp and punch constructed and arranged in such a manner as to form a very convenient and useful implement or tool for horse-shoers, horse owners, farmers, etc.]

42,919.—Water Elevator.—Samuel S. Williams (assignor to Harry J. Bailey), Pittsburgh, Pa.:

I claim, first, Forming the tilting rod, N, with an obtuse angle, t, at that part directly opposite the center of the bucket, for the purpose of slewing the bucket around, as herein set forth.

Second, I claim bending the tilting rod in such a manner as to engage the bucket on the inside, so as to not only hold the bucket in a line with the trough, but prevent lateral play, as herein-before stated.

Third, I claim the self-acting brake or pawls operated by the bail of the ascending bucket, when constructed so as to change from one side of the ratchet on the pulley to the other, substantially in the manner and for purposes herein set forth.

Fourth, I claim the curved spring, R, at the rear of the curb, for the purpose of forcing the bucket towards the tilting rod, and also as a guide to steady the bucket when in the act of tilting.

42,920.—Pump.—James Knibbs (assignor to himself and Marcus P. Norton), Troy, N. Y.:

I claim the returning of any excessive water in the force part or section of a steam, fire, or other engine pump to the suction part or section thereof, substantially as herein described and set forth.

I also claim the connecting of the discharge or force part or section

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of a steam, fire, or other engine pump, to and with the suction or supply section thereof, by means of the tube, G G, and the regulating valve, H, or any equivalent therefor, substantially as and for the purposes herein described and set forth.

RE-ISSUES.

1,677.—Cotton Gin.—Thomas C. Craven, Greenbush, N. Y. Patented Jan. 27, 1864:

I claim, first, A series of teeth connected at one end to a cylinder, within and eccentric to an outer cylinder, so that said teeth will be alternately projected and retracted in the revolution of such cylinder when said cylinders are connected together substantially as described, so that they revolve in unison upon a non-revolving shaft without strain or friction on the teeth, as and for the purpose set forth.

Second, I claim the plates, 12, constructed and adjusted as specified in combination with the cylinders, e and f, and teeth, 8, whereby the teeth can be adjusted and projected more or less, as specified.

Third, I claim constructing the teeth of the cotton ginning cylinder of pointed wires having L-shaped bands by means of which they are secured to the cylinder, e, by bands, q, as set forth.

Fourth, I claim rotating the cylinder, f, in unison with the cylinder, e, by means of the pins, 11, entering into the openings in the plates, 12, at the end of the cylinder, f, as specified.

Fifth, I claim regulating or determining the operative length of the ginning teeth by means of metallic guards between such teeth, having their supporting surfaces above the base of the teeth, so that only those portions of the teeth that are above said guard operate on the roll of cotton, as specified.

Sixth, I claim a sharp angle or bend formed in the aforesaid metallic guards at the point where the teeth draw the cotton through the guards, in combination with tapering rounded teeth projecting up between such guards and having their base below the surfaces of such guards, whereby the action of the teeth, at the point where the seeds are separated from the cotton, is not injuriously affected by the surfaces of the guards being above the base of the teeth, as specified.

Seventh, I claim conveying the cotton from the ginning cylinder up the incline, l, to the condensing cylinder by a current of air induced by the suction blower, o, entering the opening, 19, as specified.

Eighth, I claim the arrangement of the roller, t, brush, v, and adjustable guard, w, whereby the action of said brush in separating the motes can be regulated, as specified.

Ninth, I claim the condensing cylinder, m, supported and driven by the rollers, t and y, as specified, whereby the said condensing cylinder can be formed without any central axis and with its ends open for the air to be exhausted, as specified.

Tenth, I claim the exhausted condensing cylinder, m, fitted and acting as specified in combination with the rollers, y and z, for removing the cotton from such cylinder, as specified.

1,678.—Cooking Stove.—John Magee, Chelsea, Mass., assignor to the Norton Furnace Company, Norton, Mass. Patented April 15, 1862:

I claim, first, In a stove in which an enlarged oven is used, by the employment of a curved or crooked front oven plate, recessing the front plate of the stove at and over the grate so as to leave an enlarged chamber underneath the grate for the purpose of holding a large ash pan or drawer removable at the front, substantially as set forth.

Second, In a cooking stove having an enlarged oven I claim locating the ash pit over, and on a level with a hearth or thereabouts in front of the stove, substantially as set forth.

Third, In cooking stoves of otherwise ordinary or suitable construction I claim the employment of two hearths, that is to say, one over and the other under the ash pit, but both in front of the stove, substantially as set forth.

Fourth, In combination with a curved or crooked interior partition plate whereby an enlarged oven is provided, I claim an ash pit projecting in front of the enlarged oven open in front and provided with doors, etc., substantially as set forth.

Fifth, In cooking stoves of otherwise ordinary or suitable construction I claim interposing between the grate and the ash pan a hopper, or the equivalent thereof, to direct the ashes thrown or falling from the grate, substantially as set forth.

Sixth, In combination with a projecting ash pit and ash pit hearth I claim the employment of doors or equivalent closing plate located in front over the hearth as described, so as to admit of the removal of the ashes without uncovering the grate, substantially asset forth.

DESIGN.

1,948.—Stall-guard.—George R. Jackson (assi nor to himself, Burnet & Co.), New York City.

PATENTS

GRANTED

FOR SEVENTEEN YEARS!

MUNN & COMPANY,

In connection with the publication of the SCIENTIFIC AMERICAN, have acted as Solicitors and Attorneys for procuring "Letters Patent" for *new inventions* in the United States and in all foreign countries during the past *seventeen years*. Statistics show that nearly ONE-THIRD of all the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after *seventeen years'* experience in preparing specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office; but they take pleasure in presenting the annexed testimonials from the three ast ex-Commissioners of Patents:—

MESSRS. MUNN & CO.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the office, a marked deg ee of promptness, skill, and fidelity to the interests of your employers. Yours very truly,

CHAS. MASON.

Judge Mason was succeeded by that eminent patriot and statesman, Hon. Joseph Holt, whose administration of the Patent Office was so distinguished that, upon the death of Gov. Brown, he was appointed to the office of Postmaster-General of the United States. Soon after entering upon his new duties, in March, 1859, he addressed to us the following very gratifying letter:

MESSRS. MUNN & CO.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents, while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energ , marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant,

J. HOLT.

Hon. Wm. D. Bishop, late Member of Congress from Connecticut, succeeded Mr. Holt as Commissioner of Patents. Upon resigning the office he w ote to us as follows:

MESSRS. MUNN & CO.:—It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency; and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully, your obedient servant,

WM. D. BISHOP.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

As an evidence of the confidence reposed in their Agency by inventors throughout the country, Messrs. MUNN & CO. would state that they have acted as agents for more than TWENTY THOUSAND inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of inventors and patentees, at home and abroad. Thousands of inventors for whom they have taken out pat ents have addressed to them most flattering testimonials for the services rendered them; and the wealth which has inured to the individuals whose patents were secured through this office, and afterwards illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! Messrs. MUNN & CO. would state that they never had a more efficient corps of Draughtsmen and Specification Writers than those employed at present in their extensive offices, and that they are prepared to attend to patent business of all kinds in the quickest time and on the most liberal terms.

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The service which Messrs. MUNN & CO. render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there; but is an opinion based upon what knowledge they may acquire of a similar invention from the records in their Home Office. But for a fee of $5, accompanied with a model, or drawing and description, they have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through the Branch Office of Messrs. MUNN & CO., corner of F. and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office, and it is a very wise course for every inventor to pursue. Address MUNN & CO., No. 37 Park Row, New York.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if susceptible of one; or, if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by a draft on New York, payable to the order of Messrs. MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row, New York.

Patents are now granted for SEVENTEEN years, and the Government fee required on filing an application for a patent is $15. Other changes in the fees are also made as follows:—

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The Patent Laws, enacted by Congress on the 2d of March, 1861, are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners, except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

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Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention The Government fee for a caveat is $10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & CO., No. 37 Park Row New York.

EXTENSION OF PATENTS.

Many valuable patents are annually expiring which might readily be extended, and if extended, might prove the source of wealth to their fortunate possessors. Messrs. MUNN & CO. are persuaded that very many patents ar suffered to expire without any effort at extension, owing to want of proper information on the part of the patentees, their relatives or assigns, as to the law and the mode of procedure in order to obtain a renewed grant. Some of the most valuable grants now existing are *extended patents*. Patentees, or, if deceased, their heirs, may apply for the extension of patents, but should give ninety days' notice of their intention.

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Messrs. MUNN & CO. are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of their Washington Agency to the Patent Office affords them rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Their success in the prosecution of rejected cases has oeen very great. The principal portion of their charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted, are invited to correspond with MUNN & CO., on the subject, giving a brief history of the case, inclosing the official letters, &c.

FOREIGN PATENTS.

Messrs. MUNN & CO., are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business they have offices at Nos. 66 Chancery lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. They think they can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through their agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through MUNN & CO'S Agency, the requirements of different Government Patent Offices, &c, may be had, gratis, upon application at the principal office, No. 37 Park Row, New York, or any of the branch offices.

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Having access to all the official records at Washington, pertaining to the sale and transfer of patents, MESSRS. MUNN & CO., are at all times ready to make examinations as to titles, ownership, or assignments of patents. Fees moderate.

INVITATION TO INVENTORS.

Inventors who come to New York should not fail to pay a visit to the extensive offices of MUNN & CO. They will find a large collection of models (several hundred) of various inventions, which will afford them much interest. The whole establishment is one of great interest to inventors, and is undoubtedly the most spacious and best arranged in the world.

MUNN & CO. wish it to be distinctly understood that they do not speculate or traffic in patents, under any circumstances; but that they devote their whole time and energies to the interests of their clients.

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Persons who are about purchasing patent property, or patentees who are about erecting extensive works for manufacturing under their patents, should have their claims examined carefully by competent attorneys, to see if they are not likely to infringe some existing patent, before making large investments. Written opinions on the validity of patents, after careful examination into the facts, can be had for a reasonable remuneration. The price for such services is always settled upon in advance, after knowing the nature of the invention and being informed of the points on which an opinion is solicited. For further particulars address MUNN & CO., No. 37 Park Row New York.

ASSIGNMENTS OF PATENTS.

The assignment of patents, and agreements between patentees and manufacturers, carefu ly prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row, New York.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Pa k Row, New York, where any questions regarding the Rights of Patentees, will be cheerfully answered.

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TO OUR READERS.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and enclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired.

MODELS are required to accompany applications for Patents under the new law, the same as formerly, except on design patents, when two good drawings are all that are required to accompany the petition, specification and oath, except the Government fee.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgement of our reception of their funds.

Binding the "Scientific American."

It is important that all works of reference should be well bound The SCIENTIFIC AMERICAN being the only publication in the country which records the doings of the United States Patent Office, it is preserved by a large class of its patrons, lawyers and others, for reference. Some complaints have been made that our past mode of binding in cloth is not serviceable, and a wish has been expressed that we would adopt the style of binding used on the old series, *i. e.*, heavy board sides covered with marble paper, and morocco backs and corners.

Believing that the latter style of binding will better please a large portion of our readers, we commenced on the expiration of Volume VII., to bind the sheets sent to us for the purpose in heavy board sides, covered with marble paper and leather backs and corners.

The price of binding in the above style is 75 cents. We shall be unable hereafter to furnish covers to the trade, but will be happy to receive orders for binding at the publication office, No. 37 Park Row, New York.

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VOLUMES I., III., IV., VII., VIII. AND IX., (NEW SERIES) complete (bound) may be had at this office and from periodical dealers. Price, bound, $2 25 per volume, by mail, $3—which includes postage. Every mechanic, inventor or artisan in the United States should have a complete set of this publication for reference. Subscribers should not fail to preserve their numbers for binding VOLS. II., V. and VI. are out of print and cannot be supplied. We are unable to supply any of the first six numbers of the current volume. Therefore all new subscriptions will begin hereafter with the time the money is received

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Notes and Queries

L. C. B., of Denmark.—Mechanics are now well employed in this country, and all branches of manufacturing are prospering. Wages are higher than ever before known, but as an offset all articles of necessity are also much higher. If you wish to return to this country to engage in any mechanical or agricultural pursuit, you would find plenty of employment. We prefer not to discuss political questions in our paper, and in reference to the war the details are to numerous for us to attempt a weekly summary of them. We trust that all will come out right in the end.

G. G. R., of Pa.—The helical wire around your magnet must either be insulated by being covered with thread, or it must be wound so that the coils will not touch each other. It must not touch the iron. Mercury is used for making the connections. We should advise you to buy your apparatus rather than to try to makeit.

B. C., of Prince Edward Island.—The edges of india-rubber may be fastened together by means of a cement made by dissolving india-rubber in spirits of turpentine or in naptha. The edges should be faced together by powerful pressure continued for two days. The same cement and process will secure india-rubber to wood.

C. E. F., of Pa.—We have carefully examined the sketch and description of your evaporator. It seems to be well adapted to the production of sugar from sorghum, and we are of the opinion that it embraces novelty sufficient to justify an application for a patent. Send on your model by express.

M. R., of N. Y.—Send us a sketch and description of your machine for cutting ditches, and we will examine it. Horse-power will be better adapted to common use of farmers than steam.

C. A., of D. C.—We do not think you can procure in this city an engine suitable to run on common roads, unless you can furnish the necessary working drawings and contract for one to be built after your own plans.

W. J. W., of Pa.—Slippery elm will not hurt your boiler, but you should not put it in the tank but in the boiler itself. We cannot supply the number you ask for, it is out of print.

D. A. R., of N. Y.—We have received your communications on several subjects, but are obliged to decline publishing them.

C. B., of Conn.—Mr. Roper probably meant that his air engine consumed less coal than most small steam engines.

J. A. Hoxie, of Stoughton, Wis., wishes to correspond with some one having second-hand machinery for sale.

Bridesburg, Pa.—A letter is received from this place on important business, but the writer fails to sign his name.

Money Received.

At the Scientific American Office, on account of Patent Office business, from Wednesday, May 18, 1864, to Wednesday, May 25, 1864:—

B. & M., of N. Y., $16; H. & G., of N. Y., $16; A. M., of N. J., $16; R. W., of N. Y., $20; G. C. W., of Ohio, $20; F. & T., of Del., $20; R. B., of N. Y., $16; C. O. F., of Maine, $41; G. P., of Mass., $44; A. McP., of N. J., $20; J. W., of N. Y., $20; A. T., of Iowa, $20; G. C. K., of N. Y., $20; M. H. K., of N. Y., $16; P. P. P., of Mass., $21; H. B. M., of Mich., $25; W. C. B., of Cal., $21; J. P., of N. J., $16; I. H., of Wis., $23; D. C. W., of Mich., $16; J. D., of Ill., $50; B. W., of Ill., $16; E. G. W., of Minn., $16; H. F. T. H., of Wis., $25; A. H., of Ky., $30; J. J. A., of Mich., $25; W. S. R., of N. J., $16; E. T., of Pa., $25; H. M., of N. J., $31; G. F. H., of Minn., $20; P. L., of N. Y., $16; G. B. H., of N. Y., $16; J. W., of Iowa, $20; W. C. M., of N. Y., $41; H. W., of N. Y., $20; P. C., of Mass., $20; E. H., of N. Y., $22; R. G. McD., of N. Y., $16; T. & W., of N. Y., $20; J. R. B., of N. Y., $20; W. N. A., of Mo., $16; D. B. W., of Mass., $25; S. B., of Ind., $25; D. W. H., of Cal., $36; A. P., of Ohio, $10; C. H., of Ill., $25; H. H., of Iowa, $16; L. B. B., of Ill., $25; S. E. B., of Mass., $25; E. H. C., of Mich., $15; G. I., of Pa., $25; J. R., of Ill., $16; E. D. E., of Ohio, $455; P. B. P., of N. Y., $16; S. D. T., of Mass., $49; C. H. H., of N. Y., $20; D. D. G., of Wis., $20; S. W. H. W., of N. Y., $16; T. L. W., of Wis., $20; W. H. A., of N. Y., $32; H. B., of N. Y., $45; J. V., of N. Y., $16; S. D. T., of Mass., $20; H. W. C., of Vt., $41; A. J. C., of N. Y., $20; J. R. A., of R. I., $20; G. A. S., of N. Y., $16; G. L., of N. Y., $33; J. T., of N. H., $30; L. P. & N., of Pa., $25; C. B., of Ind., $16; L. W., of Ill., $20; J. A. N., of Mass., $25; T. A. G., of Ill., $26; A. A. H., of Pa., $30; F. A. B., of N. Y., $25; J. H. G. & Co., of Iowa, $20; S. & B., of Ohio, $20; W. W. L., of Ill., $25; J. N. C., of Ohio, $41; W. H. P., of R. I., $16; McK. & W., of Wis., $16; W. D. A., of Iowa, $20; J. McP., of Ill., $20; A. W. O., of Mich., $15; E. H. B., of Pa., $16; N. H., of N. Y., $16; C. L., of Canada, $15; S. G., of N. J., $15; J. G. B., of Pa., $15; G. J. B., of Ind., $51; R. S. L., of Ill., $16; S. & H., of Ohio, $15; A. K., Jr., of N. Y., $25; A. H., of Conn., $25; S. L. T., of N. Y., $16; G. B. H., of N. Y., $25; S. E. B., of Mass., $26; J. T., of Ind., $16; S. L. G., of N. Y., $16; W. G. H., of —— L. W. B., of N. Y., $45; R. & C., of Ill., $25; H. S., of Iowa, $40; T. S., of Pa., $20; W. & M., of Iowa, $26.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, stating the amount and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to

parties with the following initials have been forwarded to the Patent Office, from Wednesday, May 18, 1864, to Wednesday, May 25, 1864:—

H. M., of N. J.; H. W. C., of Vt.; W. K., Jr., of N. Y.; H. F. T. H., of Wis.; L. P. & N., of Pa.; H. B. M., of Mich.; T. F. & T., of Mass.; A. A. H., of Pa.; W. C. B., of Cal.; G. I., of Pa.; C. B., of Cal.; W. C. M., of N. Y.; T. A. G., of Ill.; S. G., of N. J.; E. T., of Pa.; P. P. P., of Mass.; J. T., of N. H.; J. A. N., of Mass.; C. H., of Ill.; L. B. B., of Ill.; S. E. B., of Mass.; W. W. L., of Ill.; C. O. F., of Maine; G. P., of Mass.; A. H., of Ky.; I. H., of Wis.; W. L., of Md.; A. H., of Conn.; W. D. A., of Iowa; D. B. W., of Mass.; D. W. H., of Cal.; F. A. B., of N. Y.; S. B., of Ind.; J. D., of Ill.; J. J. A., of Mich.; C. M., of Scotland; G. B. H., of N. Y.; R. & C., of Ill.; W. & M., of Iowa; D. K., of Ind.; S. E. B., of Mass.; C. & S. W., of Iowa.

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VIII. Calculations, Tables, &c.—Costing Goods—Rating for Shirting—Rating for a Tape Check—Rating for a Blue and White Check—Form of Rating Book—Oncost Expenses—Statement for Expenses for One Year—Charges for One Loom per Day—The Advantage of a Large Production—Manufacturers', Warpers', and Beamers' Tables.

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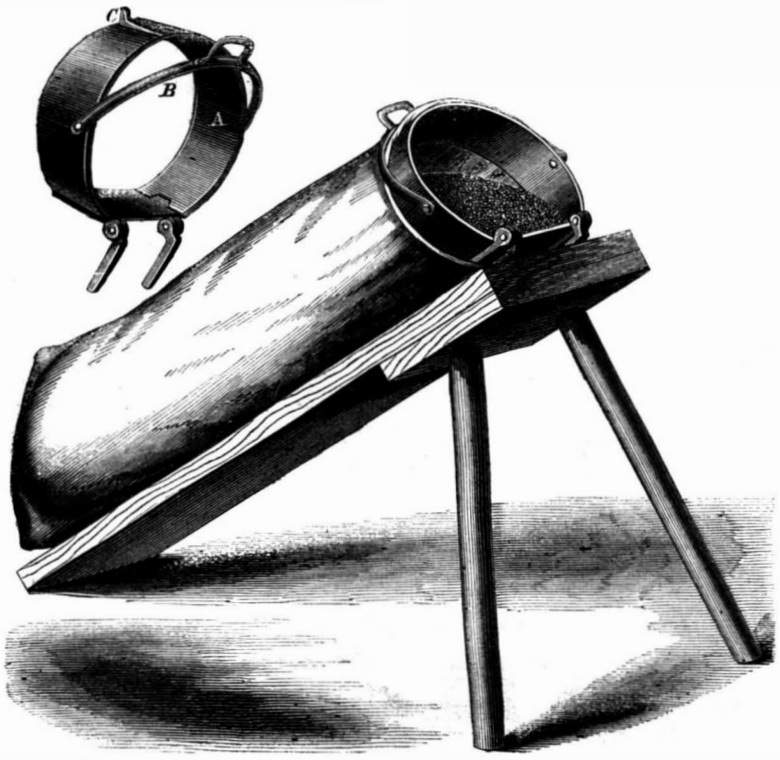
Improved Bag-holder.

The process of filling grain-bags by the usual old-fashioned method is very tedious and wasteful, for unless great care is taken and time expended, much of the grain is spilled on the floor. The little apparatus illustrated herewith is a very great aid in performing this labor, as by its use the operator is enabled to fill many more bags than by the ordinary method. In these times when labor is scarce and expensive anything that tends to cheapen it will be welcome. The apparatus consists of a light iron band, A, to which is attached the bale, B, there are also hinges at one side which have spurs that connect to brackets, or other suitable fixtures, on the bench. The operation of it is very simple; the bag to be filled is merely slipped over the band and the bale pushed down on the catch, C, over which one side of



GODFREY'S BAG-HOLDER.

the bag has been drawn, as shown in the principal figure; this keeps the mouth of the bag wide open, so that the grain may be shoveled in rapidly without waste or loss of time. These bag fillers can be attached to any size or length of bag without injury to the fabric, and may be quickly removed and made ready for work on others. Rights to manufacture and sell this useful apparatus may be had by addressing the inventor, F. Godfrey, at Grand Rapids, Mich., by whom it was patented April 12th, 1864, through the Scientific American Patent Agency.

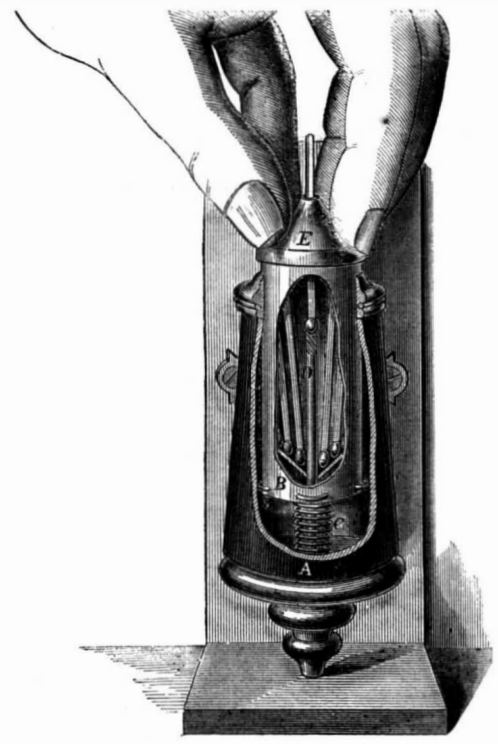
TEMPERATURES AT WHICH METALS BOIL.—These have been hitherto determined by means of an air pyrometer, but M. Becquerel has adopted another method for their determination. The instrument he employs is a thermo-electric pile, and with it he found that the following metals boil at the following degrees Fahrenheit:—cadmium 1,328; zinc 1,688; silver 1,681; gold 1,879; palladium 2,517; platinum 2,690. It is of some importance to state that certain of these figures are lower than those obtained by M. Becquerel, when using the air pyrometer.

SPECTRAL CHARACTERS OF INDIUM.—Messrs. Reich and Richter, the discoverers of this new metal, state that its presence is indicated in the spectroscope by two blue lines, one of which, the brighter, corresponds to division 98 of the scale, and the other to 135. In some cases this mode of analysis becomes unnecessary, as the instant the indium salt is placed in the flame of the Bunsen lamp, it communicates to it a bright violet tinge which they consider to be sufficiently characteristic.

SUMAC (*Rhus Glabrum*) has a large quantity of tannic acid in its leaves and bark, and is consequently useful in tanning leather,

SNOW'S MATCH-SAFE.

Since the introduction of friction matches it has been found necessary to provide some means of keeping them safe and convenient for use; but most receptacles which have been made for them heretofore, have not fulfilled all the requirements of a good match-box. Most persons have had experience in hunting after matches in the dark, and know how objectionable it is for many reasons. The box illustrated herewith is so arranged that but one match can be withdrawn at once; the contents of the box are also preserved from dampness or accidental ignition, and from being scattered about if it is overturned; children cannot get at the matches and poison themselves by sucking the ends, or perpetrate other mischief that has occurred from careless exposure of these combustibles. These features are novel and useful as every one will acknowledge. The engraving shows part of the case, A, broken out. This case is of wood and has a brass cylinder, B, inside, at the bottom of which there is a spiral spring, C, and a rod, D. The matches are put in the cylinder, which has a concave bottom, so that the matches tend to fall to the center over the rod; this latter is fixed, and when the fingers are pressed on it, as shown in the engraving, the rod forces a match up through a hole in the loose cover, E, so that it can be seized by the fingers and withdrawn for use. This convenient and ingenious match-safe works very well, and is one of the best we have seen. It was patented by George H. Snow, of New Haven, Conn., through the Scientific American Patent Agency, on April 19th, 1864; for further information address the inventor as above.



SCRIPTURAL MENTION OF FLINT WEAPONS.—The Rev. G. N. Smith mentions in a letter to Mr. Mackie, in *The Geologist*, that there occurs in the Septuagint, a passage in Joshua which relates to the burial of certain flint implements. He indicates the possibility of explaining the presence of these weapons in tumuli, by reference to the Old Testament evidence, which is as follows (Joshua xxiv. 30)—"And they buried Joshua in the border of his inheritance, and they placed with him, in his tomb, the flint knives with which he had circumcised the children of Israel; and there they are unto this day."

CHARGES of compressed tobacco are now put up by a patent process in a compact and portable form for smoking in pipes.

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